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MODULE 5



MEASUREMENT





GRADE THREE MATHEMATICS: MODULE 5

MEASUREMENT



Learning
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Branch

Grade Three Mathematics
Module 5: Measurement
Student Module Booklet
Learning Technologies Branch
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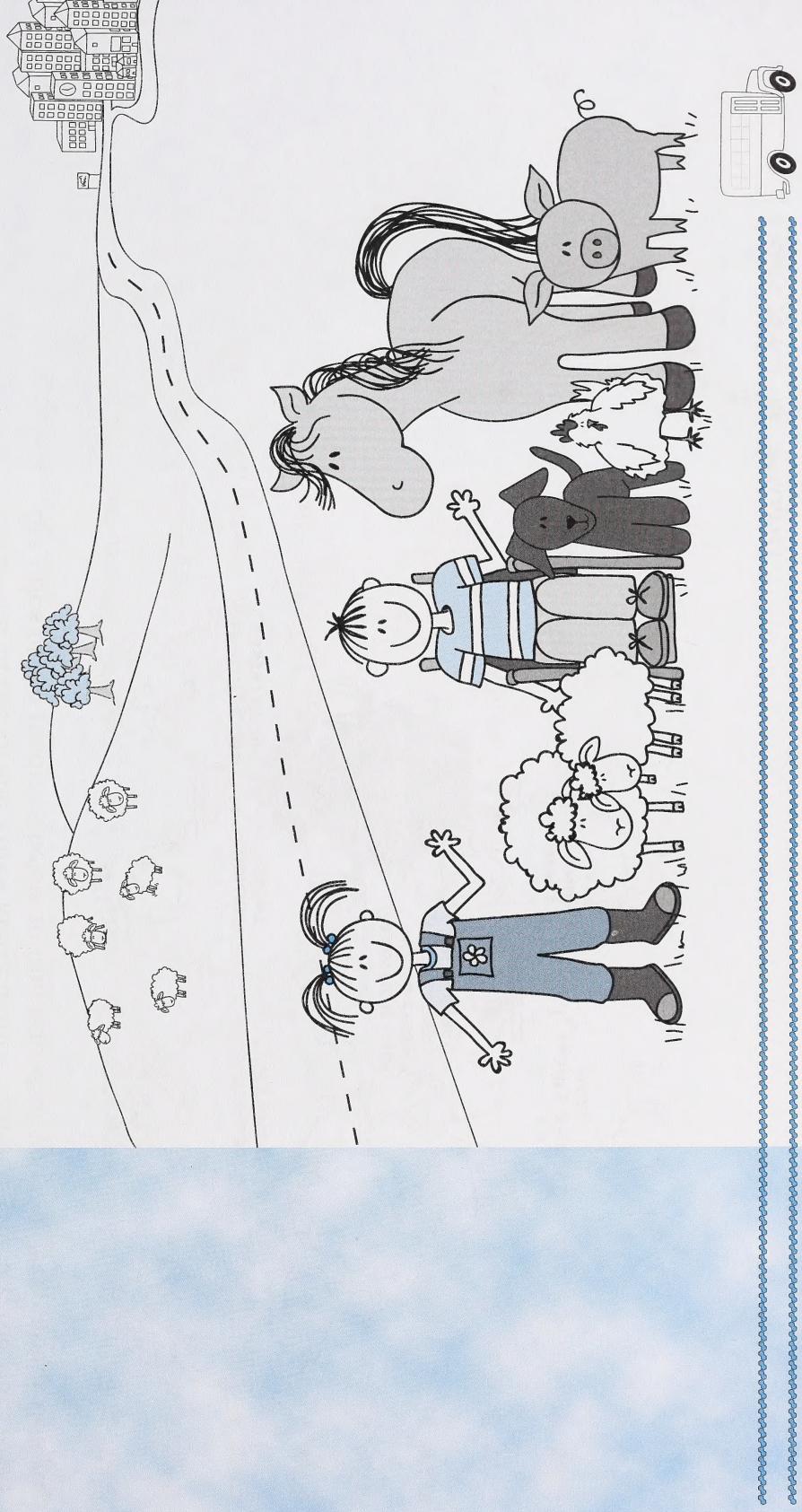
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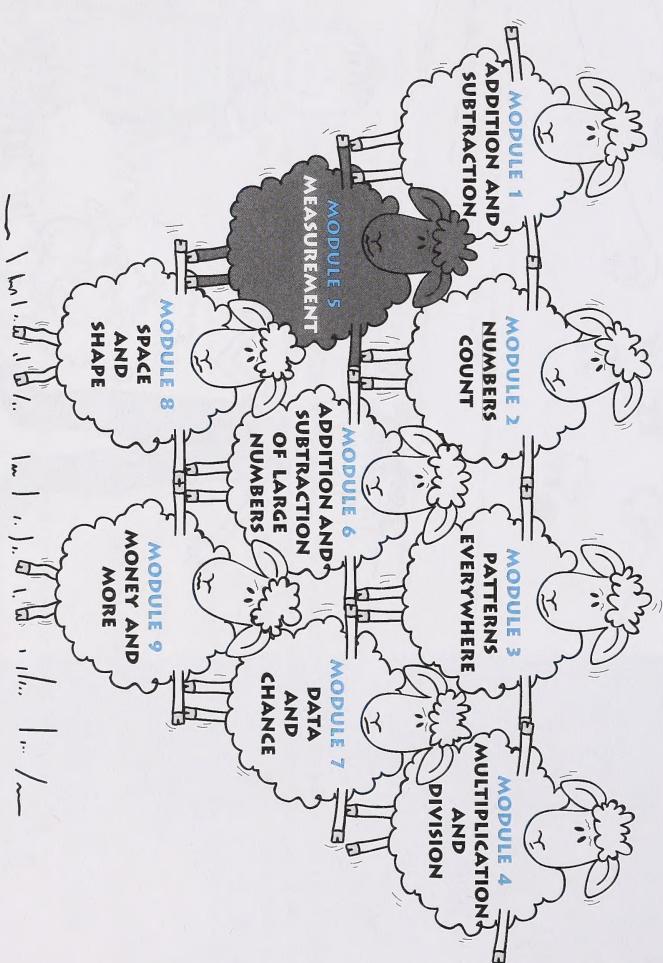
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WELCOME

TO GRADE THREE MATHEMATICS





You may not realize it, but you use mathematics many times every day. You are using math when you count the money in your pocket, find a date on the calendar, or sort your toys. As you work through Grade Three Mathematics you will learn how to do many new things. You will also learn how math can be useful in solving everyday problems.

Each unit in the Grade Three Mathematics course is called a **module**. Read the titles of the modules below to find out what you will learn about this year.



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MEASUREMENT

Measurement is a skill that you will use often as you grow older. Knowing how to measure can help you do many different jobs.

There are many kinds of measurement. You can measure the length, width, or height of something. You can measure the weight or mass of an object. Sometimes, you need to find out how much an object like a jar or pail will hold. Even time is measured!

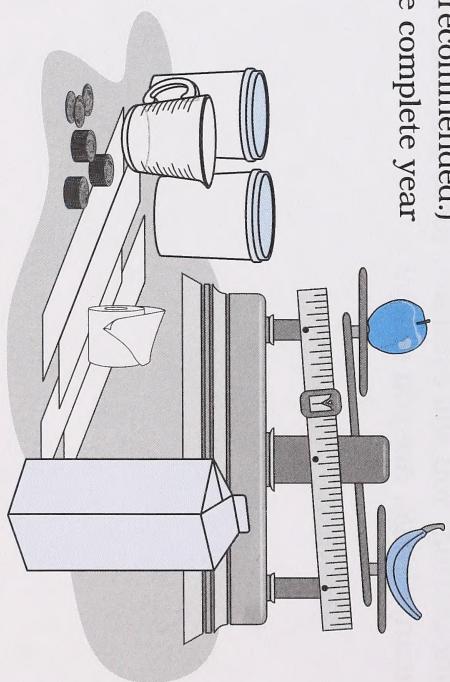
In this module, you will learn about different types of measuring. You will estimate, measure, and compare many things. Are you ready?



MATERIALS FOR MODULE 5

For Module 5, you will need the following items:

- metre-stick
- centimetre ruler
- balance scale
- kilogram and gram weights
- roll of adding-machine paper or other strips of paper
- pennies
- pattern blocks or pattern block cutouts
- 1-litre measuring container or empty 1-litre milk container
- measuring cups marked with millilitres
- variety of containers suitable for measuring capacity
- calculator (The TI-108 is recommended.)
- a calendar that shows the complete year
- glue
- scissors



If you do not have a metre-stick, instructions are included in the Appendix of this Student Module Booklet to show you how to make one from cardboard or wood.



DAY 1: HOW LONG IS IT?

You probably have measured many different things. Have you ever measured yourself to see how tall you were or how big around you were? Have you helped someone measure boards to build something?

In today's lessons, you will review what you have learned about measuring the length, height, and width of objects. You will also learn about a new unit of measurement—the kilometre.



LESSON 1

Discuss occasions when the student measured objects. Share ways that you have used linear measurement to help you with a task.

Remember a time that you measured something. What did you measure? What tools did you use to measure it? Tell your home instructor.

Have you measured the length, width, or height of an object?

You can find out how long or how tall an object is by using another object to measure it.



Take out a handful of pennies.



The pencil above is about 7 pennies long.



HOW LONG IS IT?

Use pennies to measure your pencil.

1. My pencil is about _____ pennies long.
2. Now, use your pennies to measure the following items.
 - a. A fork is about _____ pennies long.
 - b. The bottom of this page is about _____ pennies long.
 - c. Your hand is about _____ pennies long.



You may have noticed that the objects you measured are not exactly the same length as the pennies. That is why the word **about** is used.

To help people measure more accurately, **standard units** were invented. Tools, like rulers and measuring tapes, use standard units such as millimetres, centimetres, or metres to measure more exactly.



Take out your centimetre ruler.

If you do not have a centimetre ruler, have your student find "Rulers" in the Appendix. Cut out the 25-cm ruler.

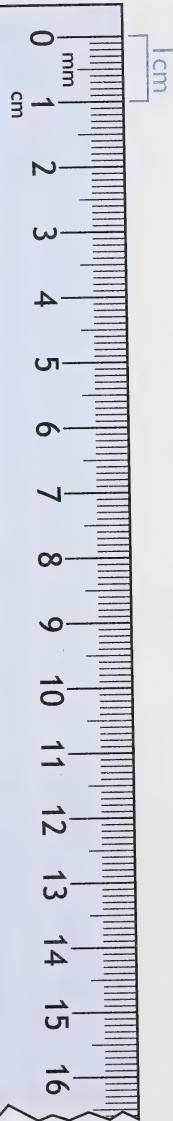
Look at the markings on your ruler. You will see letters, lines, and numbers.



MODULE 5

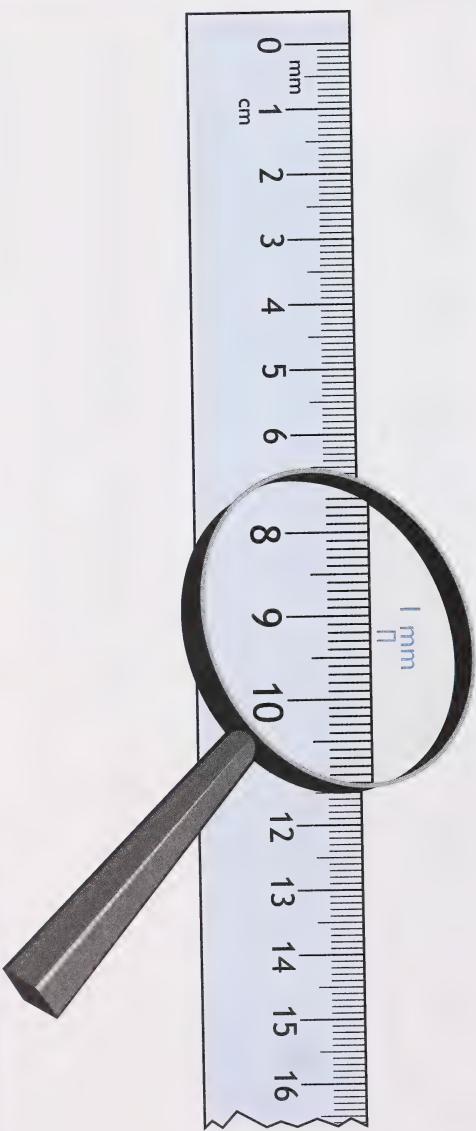
On a centimetre ruler, you will probably see the letters **mm** and **cm** at the beginning of the ruler. The **mm** is the short way of writing millimetre. The **cm** is the short way of writing centimetre. The **millimetre** and **centimetre** are standard units of measurement.

The longer lines with numbers show centimetres. The length of space between one number and the next is 1 cm.



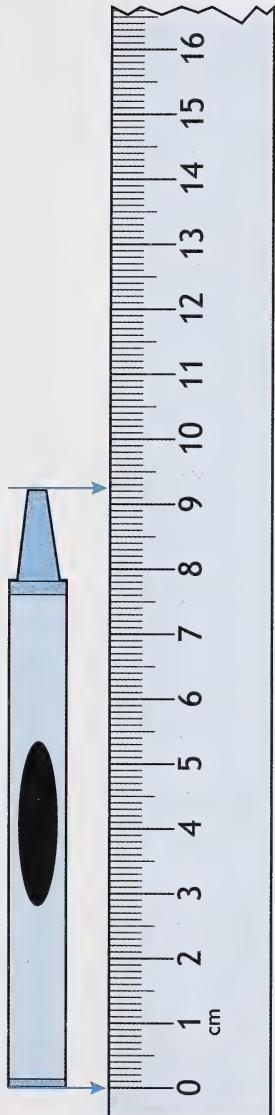
Help your student find or think of something that is about the same length as 1 cm and 1 mm.

The shorter lines show millimetres. The space between each short line is 1 mm. The millimetre is a very short length.



HOW LONG IS IT?

When you measure an object, you line up the zero mark at the left end of the ruler with one end of the object.



The number on the ruler closest to the other end of the object tells you the measurement in centimetres.

This object is closest to nine centimetres.

Now, see how to measure this needle to the nearest centimetre.



The end of the needle is closer to the 5 cm mark than the 4 cm mark, so the needle is 5 cm.



MODULE 5

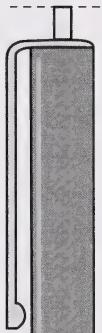
3. Use your centimetre ruler to measure the length of the objects in the pictures below. Measure to the nearest centimetre. The dotted lines are added to help you.

a.



_____ cm

b.



_____ cm

c.



_____ cm

d.



_____ cm



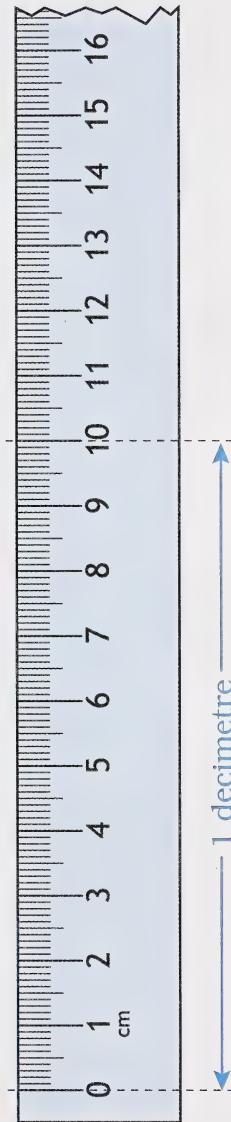
HOW LONG IS IT?

LESSON 2

Decimetres or metres may be used to measure length, too. These larger units make it easier to measure bigger objects or longer distances.

A **decimetre** is the same length as 10 centimetres.

1 decimetre = 10 centimetres



Decimetre can also be written in a short way as **dm**.

Find “Rulers” in the Appendix. Cut out the decimetre ruler.

1. Use the decimetre ruler to find 4 things in your home that are about 1 dm long. Write the names of the things you found.



MODULE 5

A **metre** is the same length as 100 cm. The short form of metre is **m**.

1 metre = 100 centimetres



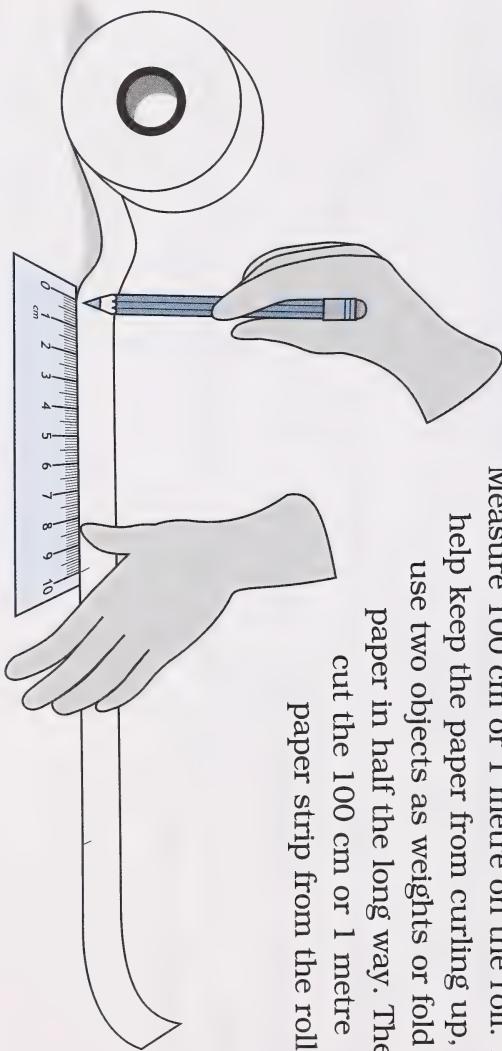
Take out a roll of adding-machine paper and your centimetre ruler.

If a roll of adding-machine paper is not available, other suitable strips of paper may be taped together to use.

Encourage your student to think of a way to measure 100 cm using a centimetre ruler. If necessary, help the student to measure out 100 cm.

Unroll approximately 1 metre or 100 cm of adding-machine paper. How could you use your centimetre ruler to measure 100 centimetres on the paper roll? Tell your home instructor your plan.

Measure 100 cm or 1 metre on the roll. To help keep the paper from curling up, use two objects as weights or fold the paper in half the long way. Then cut the 100 cm or 1 metre paper strip from the roll.



HOW LONG IS IT?

2. Use your paper strip to find 4 things in your home that are about 1 metre long. Write the names of the things you found.

LESSON 3

When very long distances are measured, **kilometres** are used.

The short way of writing kilometres is **km**.

You have probably noticed road signs that tell the distance to the next town or city.

The first part of the word kilometre is **kilo**. That means 1000. The second part is metre. A kilometre is the same as 1000 metres.

1 kilometre = 1000 metres

Look at your paper strip that is 1 metre long. Think about how far away 1000 metres or 1 kilometre would be. Tell your home instructor.

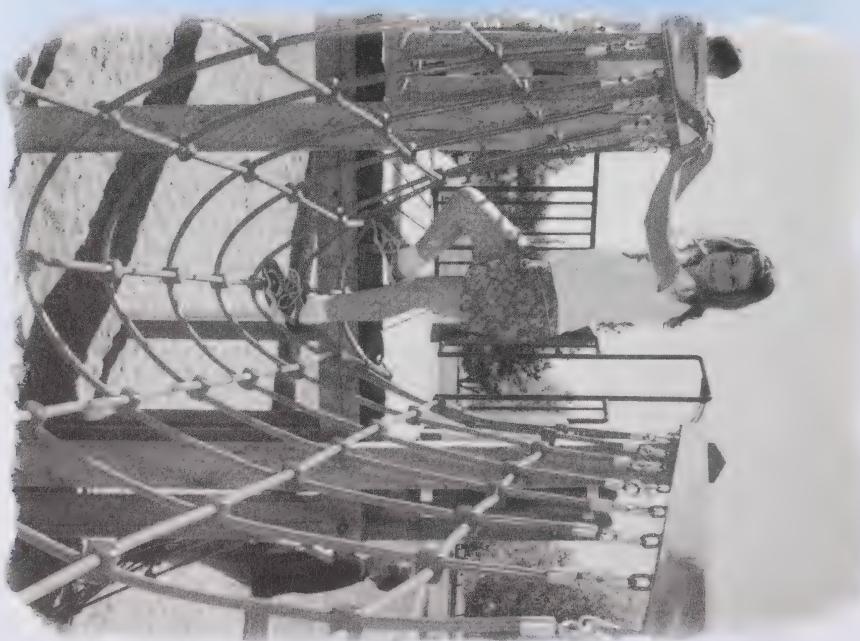


DAY 2: ESTIMATING, MEASURING, AND RECORDING

When building, good measuring skills are very important. Can you imagine the estimating and measuring required to build a new playground?

Usually, you need exact answers when you measure but sometimes an estimate will do.

Get ready to estimate and measure lots of different objects!

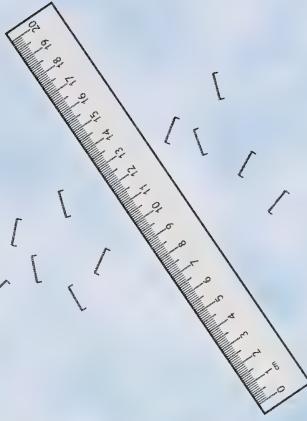


ESTIMATING, MEASURING, AND RECORDING

LESSON 1

In the activities on Day 1 of this module, you found some things that were 1 centimetre, 1 decimetre, or 1 metre long or wide.

To estimate the length or width of an object, think about something that is about the same size as a centimetre, a decimetre, or a metre.



I found out that a staple was about 1 cm long. When I estimate how many centimetres long an object is, I think about how many staples would fit along it.

1. Estimate the length of the chocolate bar in staples and cm.



Estimate: _____ staples Estimate: _____ cm



MODULE 5

Your own body parts can help you estimate, too.

2. Find a part on your hand that is about 1 cm long or wide.

a. My _____ measures about 1 cm.

b. Use this measurement to estimate how many centimetres long this picture is.



Estimate: _____ cm

Take out your centimetre and decimetre rulers.

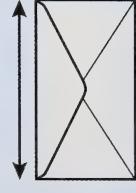
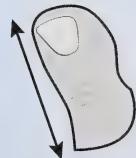
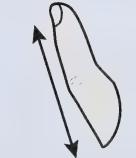
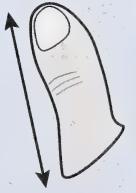
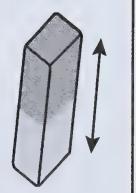


Be sure that your student estimates each distance before measuring.

3. Write your estimate in centimetres for each of the following objects in real life. Measure the real objects to the nearest centimetre using your ruler. See how close your estimate is to the actual measurement.



ESTIMATING, MEASURING, AND RECORDING

Object	Estimate	Actual
your shoe		
an envelope		
your big toe		
your little finger		
your thumb		
an eraser		

Discuss with your student the comparison between the estimate and the actual measurement.

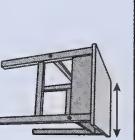
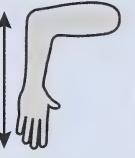


MODULE 5

LESSON 2

You can estimate decimetres in the same way. Find a part of your hand that is about 1 dm long or wide.

1. My _____ is about 1 dm.
2. Write your estimate in decimetres for each of the following objects in real life. Then measure the real objects to the nearest decimetre using your decimetre ruler.

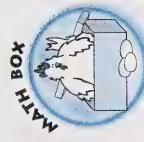
Object	Estimate	Actual
door		
table or desk		
from your finger tips to your elbow		
spoon		



ESTIMATING, MEASURING, AND RECORDING

LESSON 3

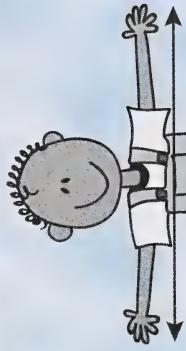
You have estimated and measured centimetres and decimetres. You are now ready to estimate and measure metres.



Take out your metre-stick. If you do not have a metre-stick, find “Metre-Stick” in the Appendix, and follow the instructions to make your own metre-stick. Ask your home instructor to help.

1. Ask someone to measure your height and then to measure your arm span from the tip of your fingers on one hand to the tip of your fingers on your other hand.

Which is nearer to 1 metre in length?



Help measure your student's height and arm span. Which is nearer to 1 metre?

These measurements will be virtually identical!

That was a tricky question! Were you surprised at the answer?

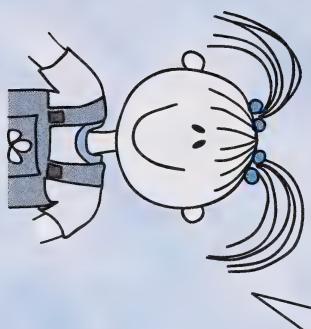
Now you will estimate and measure objects on your own.

1. Estimate the height of each of the following objects in real life. Tell if it is more than or less than one metre. Use your metre-stick to measure the real object and write **yes** if you were correct and **no** if you were not. Sarah has done the first one for you.



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I estimated the chair leg is **less than** 1 m high, so I wrote that in. When I measured the leg to check, I was correct. So, then I wrote **yes**.



Object	Estimate	Actual
chair leg	less than	yes
door		
the kitchen cupboards		
your home instructor		
washing machine		

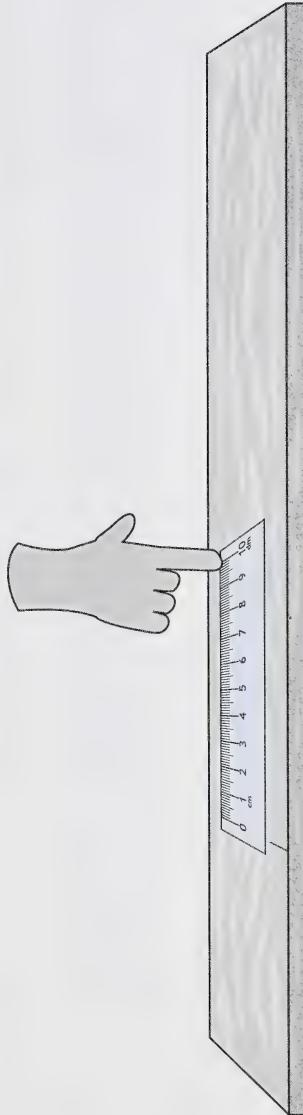
Using a metre-stick, demonstrate how to measure objects that are longer than a metre.

Remember, when measuring long objects, you may need to mark the end of the ruler and move it down to measure again. Then you count how many times you used the ruler and add up your measurements.

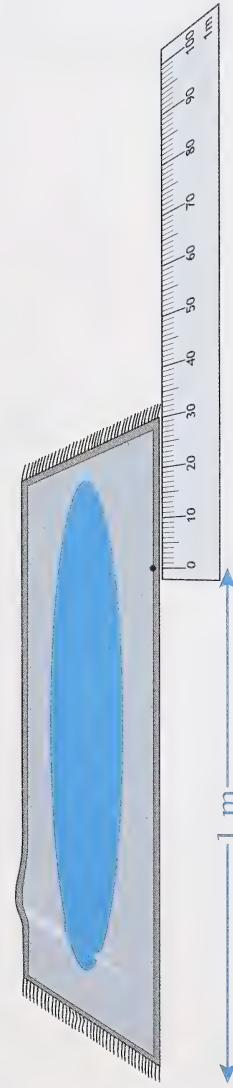


ESTIMATING, MEASURING, AND RECORDING

You can mark the end of the ruler by placing your finger, a line, or small object there.



Remember, if the last measure is less than one-half of the metre-stick (50 cm or less), count back to the metre that comes before. If the measure is more than one-half of the metre-stick (50 cm or more), count to the next metre. The rug is more than 1 m long, but it is less than half way to the next metre. So, to the nearest metre, the rug is 1 metre long.



A tape measure is often used to measure distances that are over one meter. It gives an exact answer without having to move a ruler and count.



3. Estimate the height or width to the nearest metre of each of the following objects in real life. Then measure the real objects to the nearest metre using your metre-stick.

Object	Estimate	Actual
kitchen cupboard		
dining table		
window		
door		
refrigerator		

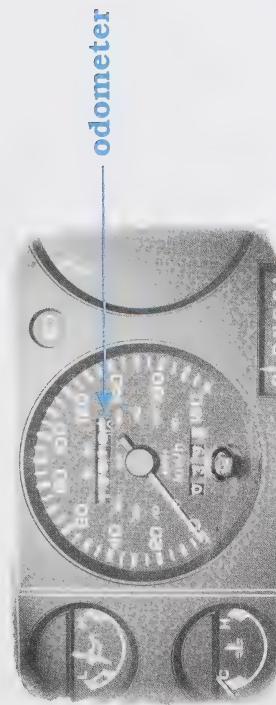


ESTIMATING, MEASURING, AND RECORDING

On Day 1, you learned about kilometres. Can you remember how long a kilometre is?

4. 1 kilometre = _____ metres (m)

Since a kilometre is such a long distance, it is usually measured with an **odometer** in a vehicle. An odometer is an instrument that measures the distance a vehicle travels by counting the number of times the wheels go around.



Encourage your student to estimate and select a spot that is 1000 metres or 1 km in distance away. If possible, use known distances or a car odometer to check your student's guess. Discuss the findings with your student.

Next time you are in a vehicle, ask your home instructor to show you the odometer. Try to estimate a landmark that you think is about one kilometre away. Watch the odometer to see how close your estimate was. It's fun to have several family members guess how far a kilometre is. Who can estimate the closest?



Go to Assignment Booklet 5A.

MODULE 5

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DAY 3: WHICH IS LONGEST?

Being able to estimate which item is longest, widest, or tallest is a helpful skill. If your mom asked you to find the shortest board in a pile of lumber, do you think you could help her?

You will learn about comparing and ordering length, width, and height in today's lessons.



WHICH IS LONGEST?

LESSON 1

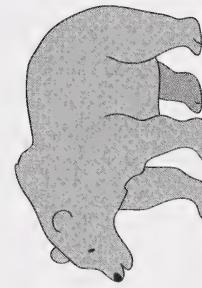
You often need to compare the length, width, or height of objects in everyday life. When you compare two objects, you think about which is

- longer or shorter
- wider or narrower
- taller or shorter

Sometimes you need to compare one distance to another to find out which is closer or farther away.

You can compare and order items by estimating or measuring.

Look at the two animals that follow.



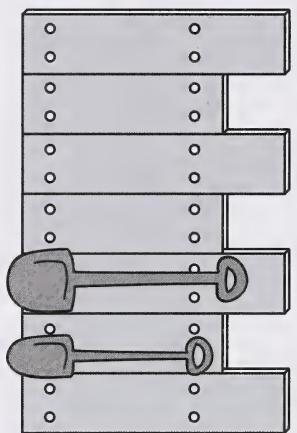
1. Which animal is taller? _____

Since there is a large difference in height, it is easy to estimate which is taller.



MODULE 5

If you can place the items you are comparing close together, in a line, or at the same starting point, it is easier to see which is taller or longer.



When the lengths, heights, or widths of objects are almost the same, you will need to measure to compare them. If they are far away from each other or in different positions, you may also need to measure to compare them.



WHICH IS LONGEST?



Take out your centimetre ruler.

2. Use your ruler to find out which arrow is longer. Remember, the greater the number, the greater the length.



Arrow _____ is longer.

3. Use your ruler to find out which lightning bolt is longer.



Lightning bolt _____ is longer.

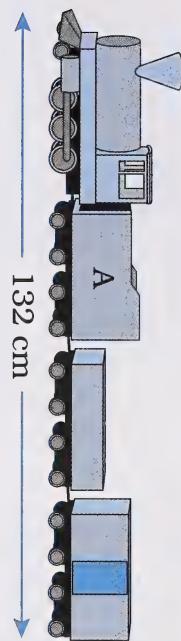
If necessary, review how to compare and order numbers. See Module 2, Day 5 and Day 6.



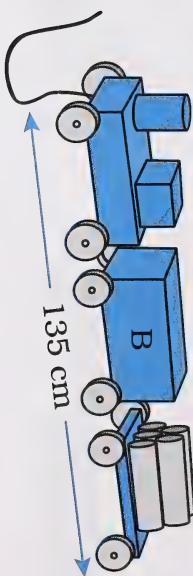
MODULE 5

Sometimes in drawings or diagrams, measurements are given in numbers to tell you how long or wide the item is.

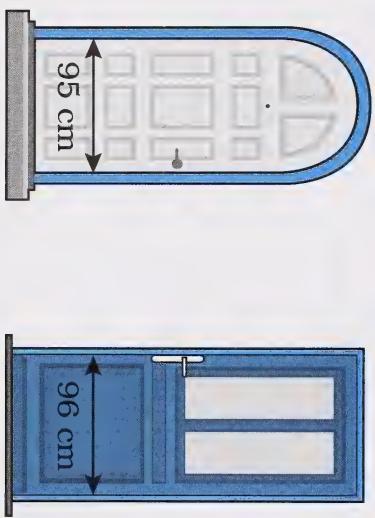
When objects have already been measured for you, look at the numbers to compare them.



4. Which train is the shorter train? _____



A B

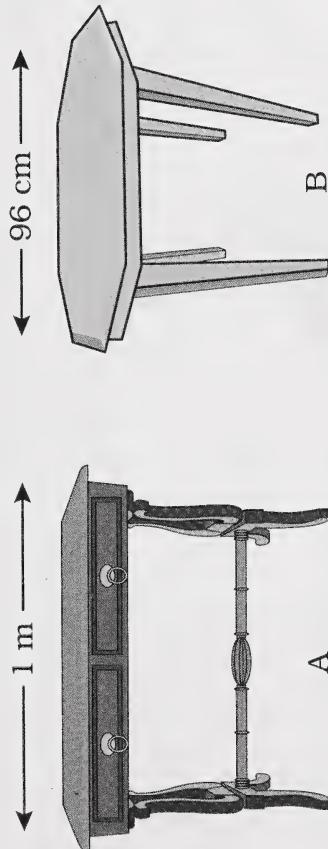


5. Which door is wider? _____



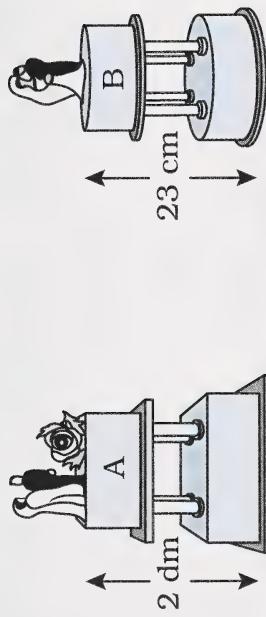
WHICH IS LONGEST?

Sometimes measurements may be given in different units.



6. Which table is wider? (Hint: Think about how many centimetres there are in a metre.)

This idea is sometimes difficult for students to understand. Provide support as needed. If necessary, take out the metre-stick to demonstrate that one metre is the same as 100 cm.



7. Which cake is taller? (Hint: Think about how many centimetres there are in 2 decimetres.)

Provide support as needed. Does your student realize that since there are 2 decimetres, the height in A will be 2×10 or $10 + 10 = 20$ cm?

If necessary, help your student by using a metre-stick, counting by 100s, or adding 100s.

8. Change the metres to centimetres for more practice.

Example: 3 metres = 300 cm

a. 5 metres = _____ cm

b. 2 metres = _____ cm

c. 10 metres = _____ cm

d. 8 metres = _____ cm



Sometimes you may have more than two measurements in different units, so you must change all the measurements to the same units. For example, you may find the units in centimetres, decimetres, and metres. You will have to change them all to centimetres.

LESSON 2

If necessary, refer back to Day 6 of Module 2.

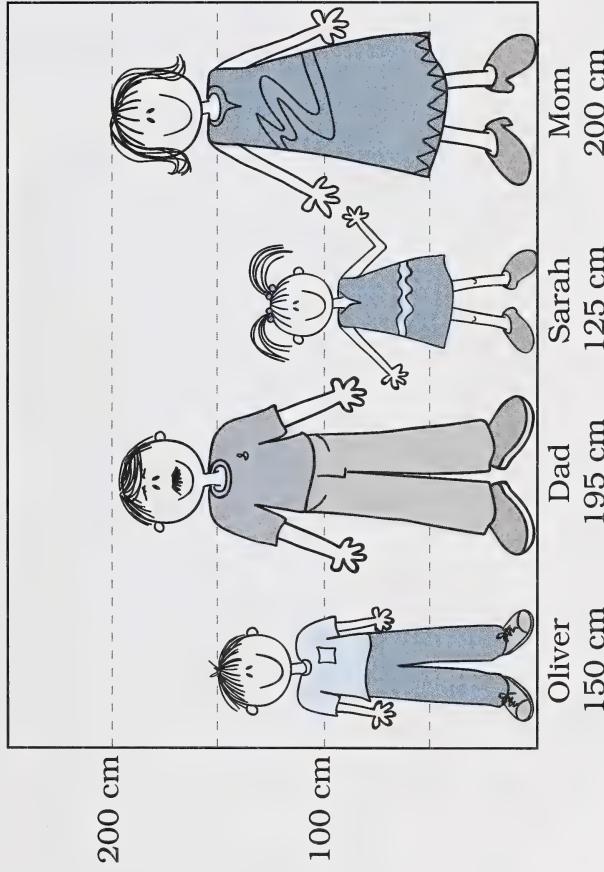
Do you remember putting numbers in order in Module 2?

At times, you will need to put several objects in order from longest to shortest, widest to narrowest, or tallest to shortest. Distances can also be ordered.



WHICH IS LONGEST?

Look at the following graph showing the heights of Sarah's family.



1. Who is shortest? _____
2. Who is tallest? _____
3. Write the names of the family members in order from tallest to shortest.

Look at the distances in the chart below.

Distance from Sarah's House

Destination	Kilometres
post office	15 km
store	17 km
veterinarian's office	45 km
doctor's office	110 km
friend's house	3 km

4. Which place is farthest from Sarah's house? _____

5. Which place is closest to Sarah's house? _____

6. How many metres is it to Sarah's friend's house? _____

If necessary, remind your student that
1 km = 1 000 m.



Go to Assignment Booklet 5A.



DAY 4: CENTIMETRES, METRES, OR KILOMETRES?

Altogether, you have learned five units of measurement that are used to measure length, height, or width. Can you name them?

Today, you will practise choosing the best unit to measure an object or a distance.



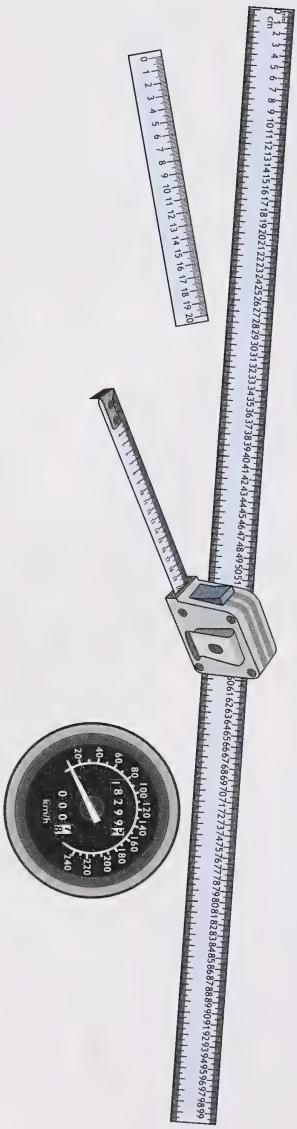
MODULE 5

LESSON 1

When you need to measure something, you must first decide what unit is best to use. You have learned the names of five different units of measurement:

- millimetre
- decimetre
- centimetre
- metre
- kilometre

You can then choose the best tool that can help you make that measurement.



A millimetre is the smallest measurement on your ruler. You will learn more about millimetres in Grade Four Mathematics.



CENTIMETRES, METRES, OR KILOMETRES?

1. Can you remember the following measurements?

a. 1 decimetre = _____ centimetres

b. 1 metre = _____ centimetres

c. 1 kilometre = _____ metres

Centimetres, metres, and kilometres are the units that are used most often in everyday measurements.

Centimetres are usually used to measure small-sized and medium-sized objects and distances. Metres are used to measure larger objects and distances. Kilometres are used to measure the longest distances.

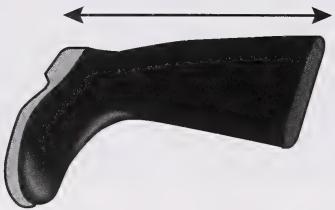
2. Read the following. Then write which unit (**centimetre**, **metre**, or **kilometre**) would be best to use to measure each length or distance in real life.

a. the length of a house _____

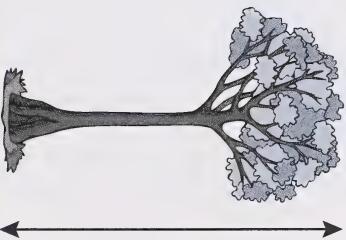


Your student may need to check previous lessons for these equivalent measurements.

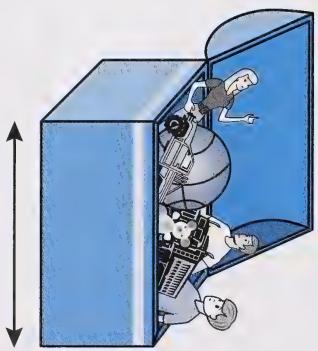
b. the height of your boot



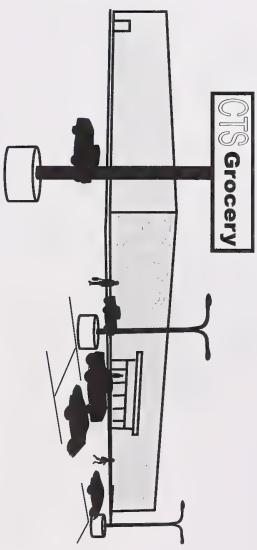
d. the height of a tree



c. the length of a toy box

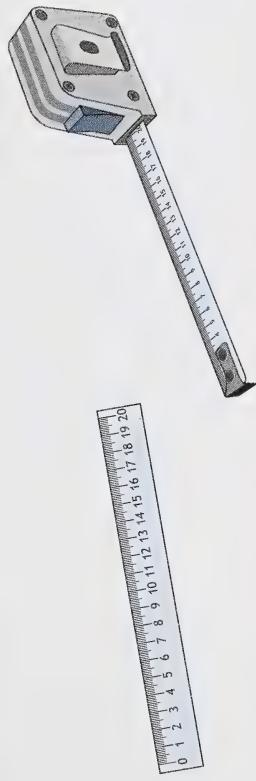


e. the distance to the nearest grocery store

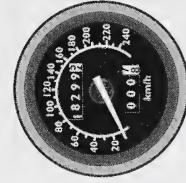


LESSON 2

1. A **ruler**, a **tape measure**, and an **odometer** are tools you use to help you measure. Which tool would you use to measure the following?



ruler



tape measure

odometer

- a. the distance for a relay race _____
- b. an eraser _____
- c. your height _____
- d. the distance to your favourite toy store _____
- e. the length of a magazine page _____

As you work through this module, you will practise your multiplication facts in the timed exercises. Are you ready for the first exercise? Ask your home instructor to time you for 2 minutes and to mark your answers. Remember to record your scores here and on your Math Facts Graph from the Appendix.



MODULE 5

TIMED EXERCISE: 2 MINUTES

$4 \times 4 = \underline{\hspace{1cm}}$

$5 \times 8 = \underline{\hspace{1cm}}$

$8 \times 3 = \underline{\hspace{1cm}}$

$6 \times 6 = \underline{\hspace{1cm}}$

$9 \times 4 = \underline{\hspace{1cm}}$

$4 \times 3 = \underline{\hspace{1cm}}$

$5 \times 5 = \underline{\hspace{1cm}}$

$4 \times 2 = \underline{\hspace{1cm}}$

$3 \times 6 = \underline{\hspace{1cm}}$

$8 \times 4 = \underline{\hspace{1cm}}$

$3 \times 5 = \underline{\hspace{1cm}}$

$9 \times 2 = \underline{\hspace{1cm}}$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 0 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$$



Go to Assignment Booklet 5A.

Number completed	
Number correct	



DAY 5: AROUND THE OUTSIDE

You have practised measuring length and distance the last few days.

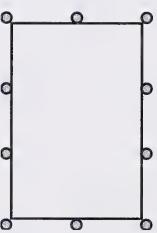
In today's lessons, you will learn how to measure around the outside of a shape. Do you know what this measurement is called?



MODULE 5

LESSON 1

Sarah is helping her dad build a new pen for her calf. They put the posts 1 metre apart. Now, they need to find out how far it is around the pen so they can buy the boards for the fence.



The student may suggest counting the number of spaces between posts or measuring with a measuring tape.

How could Sarah find out how far it is around the outside of the pen? Tell your home instructor.

If the student suggests counting the posts on each side and adding them up, show him or her why that will not work ($4 + 3 + 4 + 3 = 14$).

The distance around the outside of an object or figure is called the **perimeter**.

MATH BOX

 Take out your pattern blocks. Find all the small squares. If you do not have pattern blocks, use the small squares from the block cutouts.



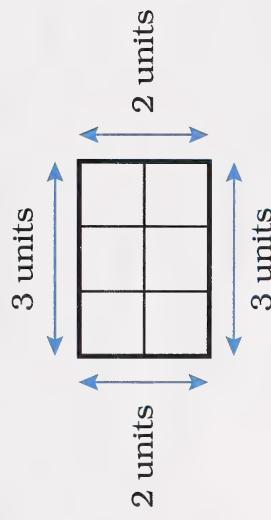
AROUND THE OUTSIDE

Build a rectangle with your squares to represent Sarah's calf pen. In your model and the following model, each square stands for one unit.



1. How many units long is the top? _____
2. How many units high is the right side? _____
3. How many units long is the bottom? _____
4. How many units high is the left side? _____

You can write the distances to help you remember.



To find out how far it is around the outside, you can add the distances of the four sides.

If necessary, review how to add several numbers. Remind the student that the groups can be changed around or added in any order. For example, the student may think $3 + 2$ is 5 and $3 + 2$ is 5 more. $5 + 5$ is 10. Encourage the student to use previous mental math strategies to add these numbers.

5. $3 + 2 + 3 + 2 =$ _____ units

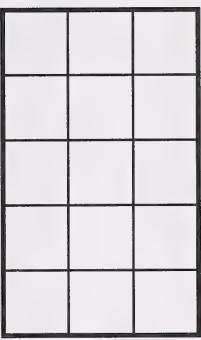
6. The perimeter of this rectangle is _____ units.

7. Sarah and her dad were using metres to measure, so the perimeter of the

pen is _____ metres.

8. Find the perimeter of each of these rectangles by counting and adding the number of units on each side.

a.



$$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

The perimeter is _____ units.



AROUND THE OUTSIDE



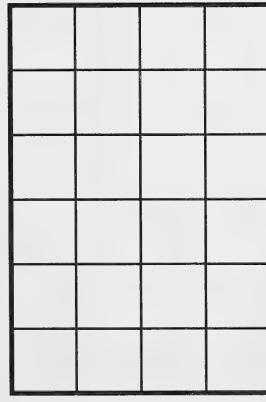
MODULE 5



b.

$$+ \quad + \quad + \quad =$$

The perimeter is _____ units.



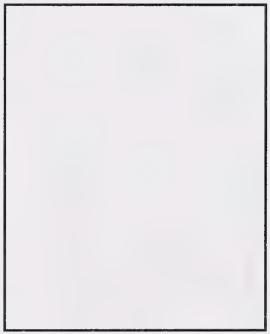
c.

$$+ \quad + \quad + \quad =$$

The perimeter is _____ units.

If the student suggests marking in the units as the previous activity, discuss how he or she may do so. However, guide the student to discover that measuring with a measuring tool would be easier.

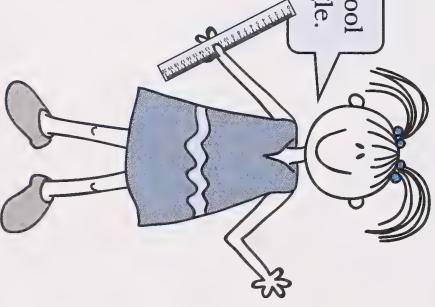
There are no units marked on the outside of the following rectangle. How could you find out what the perimeter is? Tell your home instructor your idea.



You can find out the perimeter of the rectangle by measuring the sides with a ruler and then adding those measurements together.

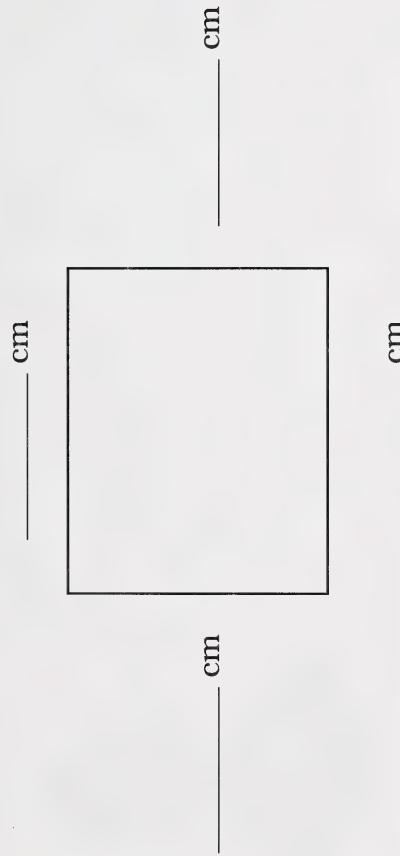
Take out your centimetre ruler.

A centimetre ruler is the best tool to use to measure this rectangle.



AROUND THE OUTSIDE

9. Measure each side of the following rectangle, and write the measurement on the line beside it.



10. Add the measurements to find the perimeter.

$$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

The perimeter is _____ cm.

11. What do you notice about the opposite sides of a rectangle?

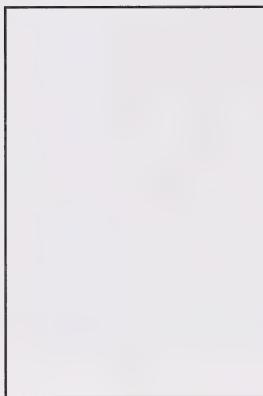


MODULE 5

The top and bottom measurements of a rectangle are the same. The left and right side measurements are the same too. You don't need to measure all four sides. Just measure one long side and one short side.

12. Use your centimetre ruler to find the perimeter of these rectangles.

a.



$$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

The perimeter is cm.

b.



$$\underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

The perimeter is cm.

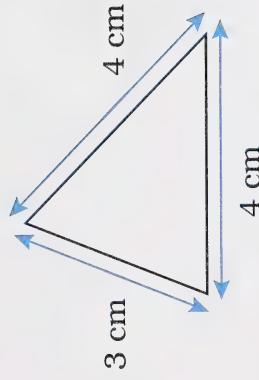


I'm catching on to
measuring perimeters.
It's easy now.



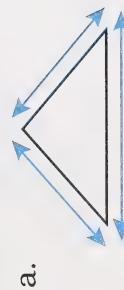
LESSON 2

You can find out the perimeter of any shape that has straight sides by adding the number of units on each side.



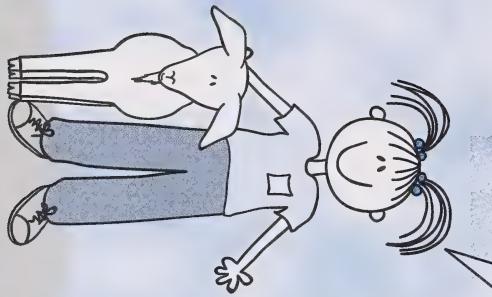
Since a triangle has three sides, you have three measurements to add.

1. $3 \text{ cm} + 4 \text{ cm} + 4 \text{ cm} = \underline{\hspace{2cm}}$ cm
2. Use your centimetre ruler to measure each side of the triangles that follow. Find the perimeter for each.



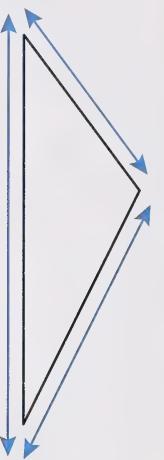
$$\underline{\hspace{2cm}} \text{ cm} + \underline{\hspace{2cm}} \text{ cm} + \underline{\hspace{2cm}} \text{ cm} = \underline{\hspace{2cm}} \text{ cm}$$

The perimeter is $\underline{\hspace{2cm}}$ cm.

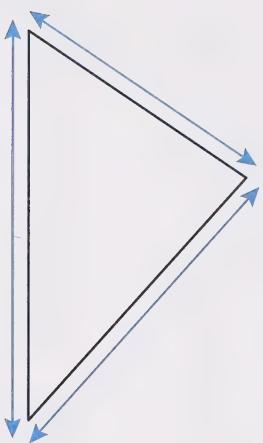


I went around the perimeter
of the goat pasture, and it
was 3 km by 1 km by 1 km!
Wow! I walked 5 km!

b.



c.



The perimeter is _____ cm.

_____ cm + _____ cm + _____ cm = _____ cm

The perimeter is _____ cm.

3. Find the perimeter of the following shapes. The centimetres are marked for you but notice there are more sides.

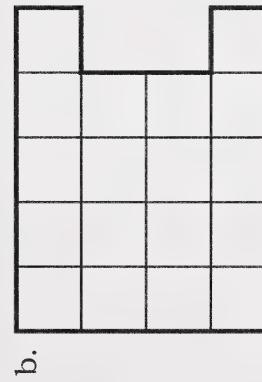


To find the perimeter, I add the lengths of all the sides.



$$\underline{\hspace{1cm}} \text{ cm} + \underline{\hspace{1cm}} \text{ cm} = \underline{\hspace{1cm}} \text{ cm}$$

The perimeter is $\underline{\hspace{1cm}}$ cm.



$$\underline{\hspace{1cm}} \text{ cm} + \underline{\hspace{1cm}} \text{ cm} = \underline{\hspace{1cm}} \text{ cm}$$

The perimeter is $\underline{\hspace{1cm}}$ cm.

DAY 5

c.



$$\underline{\hspace{1cm}} \text{ cm} + \underline{\hspace{1cm}} \text{ cm} = \underline{\hspace{1cm}} \text{ cm}$$

The perimeter is $\underline{\hspace{1cm}}$ cm.

d.



$$\underline{\hspace{1cm}} \text{ cm} + \underline{\hspace{1cm}} \text{ cm} = \underline{\hspace{1cm}} \text{ cm}$$

The perimeter is $\underline{\hspace{1cm}}$ cm.



Go to Assignment Booklet 5A.



GRADE THREE MATHEMATICS

DAY 6: MEASURING AREA

On Day 5, you learned how to measure the outside or perimeter of a shape. You will find out how to measure the space that is inside a shape today.

Do you know what this space is called?



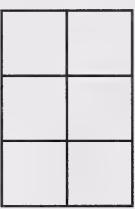
LESSON 1

Sarah and her dad want to know how much space is inside the calf pen. How could they find out?



Take out your pattern blocks. Find all the small squares. If you do not have pattern blocks, use the small squares from the block cutouts.

Do you remember how you used the small squares from the pattern blocks to build a model of Sarah's calf pen? It looked like this:

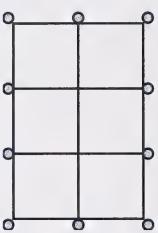


You can count the number of square blocks to describe the space that is inside the pen.

1. How many square blocks does it take to cover the space inside the pen?

It takes _____ square blocks to cover the space inside the pen.

Since the blocks are shaped like squares, you can describe the space inside the pen as 6 square units.



MEASURING AREA

Sarah and her dad were using metres to measure, so the pen is 6 square units or 6 square metres.

The space inside a flat shape is called the **area**. Area is always measured in **square** units.

2. Use your square pattern blocks to measure the area of the shapes below.



The area of the rectangle is _____ square units.



The area of the square is _____ square units.

Assist your student in using the square pattern blocks as units to measure the area of the rectangles.

Remind your students that area is always given in “square” units.



MODULE 5

After doing a few examples, your student may realize that the area of a rectangle looks like a grid or an array in multiplication. The student may also realize that the area of a rectangle may be found by multiplying the length by the width (just like an array).

c.

The area of the rectangle is _____ square units.

d.

Measuring area is like using a grid or an array in multiplication.

The area of the rectangle is _____ square units.

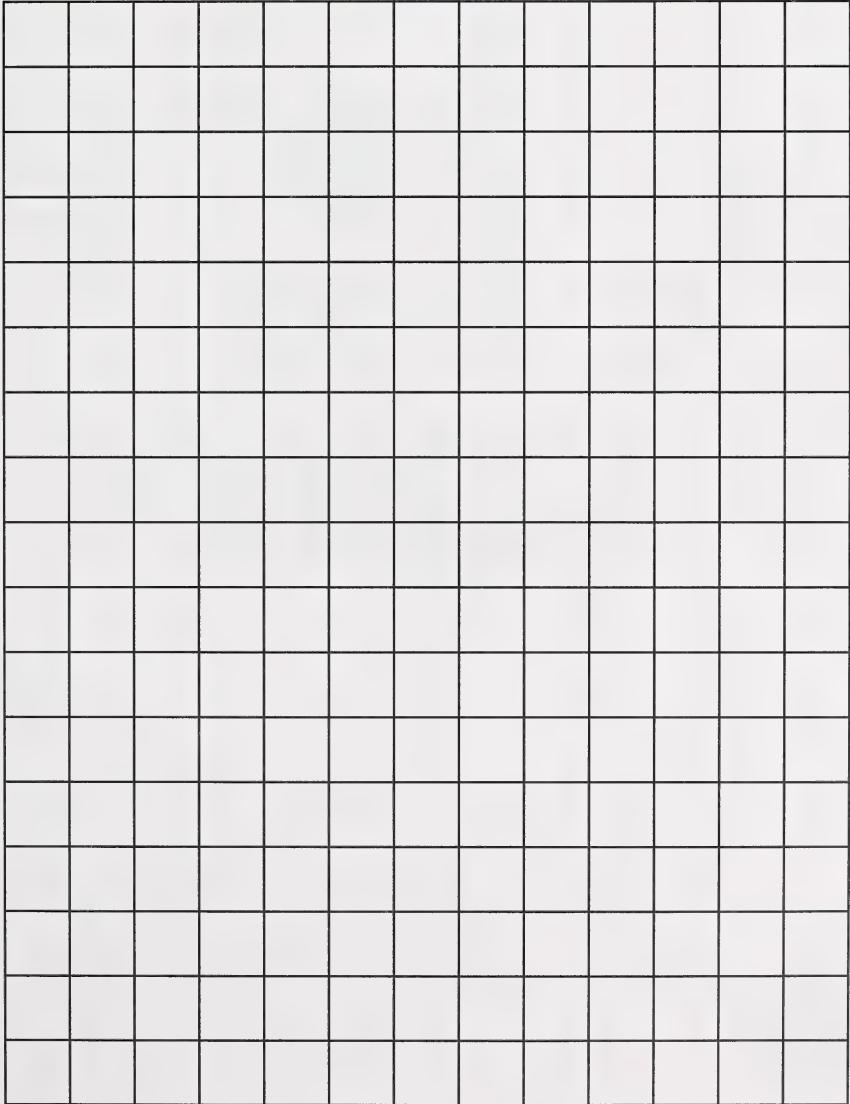
You have used pattern blocks or small squares to find area. You can also use a grid to help you find the area of a flat object.

Take out your calculator. Keep the lid on the calculator.



MEASURING AREA

Put your calculator on the grid below. Line up the top of your calculator with the top line of the grid. Line up the side of your calculator with the side of the grid. Trace around the edge of your calculator. Count how many square units are inside the outline you drew.



The number of square units tells you the area.

3. The area the calculator covers is about _____ square units.

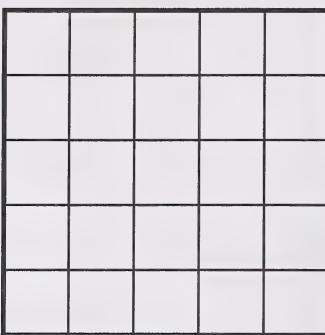
Find a CD case, computer disc, or tiny flat box such as a paper-clip box. Go back to the grid on the previous page and trace around the outside of your item.

4. The area the object covers is _____ square units.

You can use a grid to find the perimeter, too.

5. Find the perimeter and area of each of the following shapes.

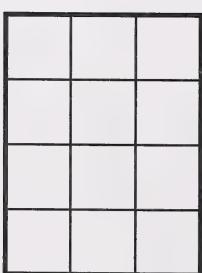
a.



b.



c.



Perimeter: _____ units

Perimeter: _____ units

Perimeter: _____ units

Area: _____ square units

Area: _____ square units

Area: _____ square units



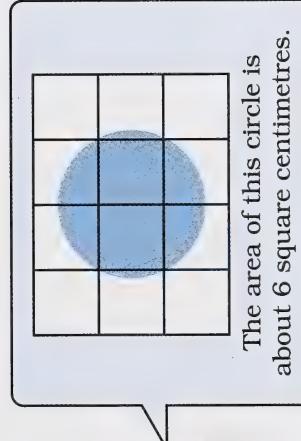
54

LESSON 2

Sometimes, you need to find the area of a shape that does not fit exactly into a grid. A grid can help you estimate the area. Remove the “Centimetre Grid Paper” from the Appendix.

Put one hand flat on the grid and trace around it. Count all the square units that are more than one-half inside the line.

1. The area of my hand is about _____ square units.



The area of this circle is
about 6 square centimetres.

Find a cup or glass. Turn it upside down on the grid paper. Trace around the edge. Count all the square units that are more than one-half inside the line.

2. The area of the cup is about _____ square units.



Go to Assignment Booklet 5A.

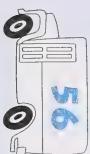
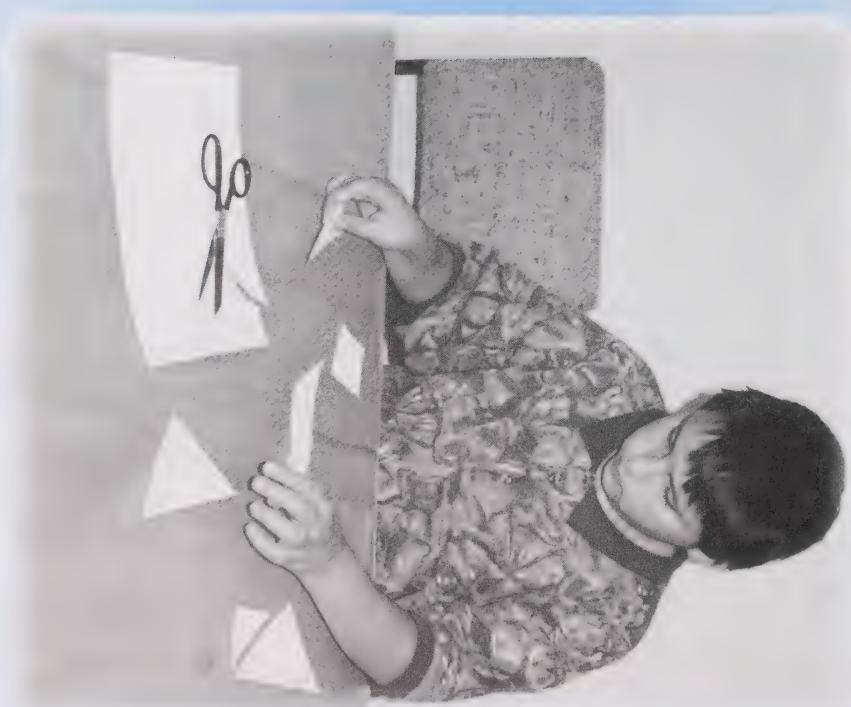


MODULE 5

DAY 7: COMPARING PERIMETER AND AREA

Today, you will have some fun experimenting with perimeter and area. Can you figure out which shapes have a greater perimeter or area?

Get ready to do some estimating and measuring!

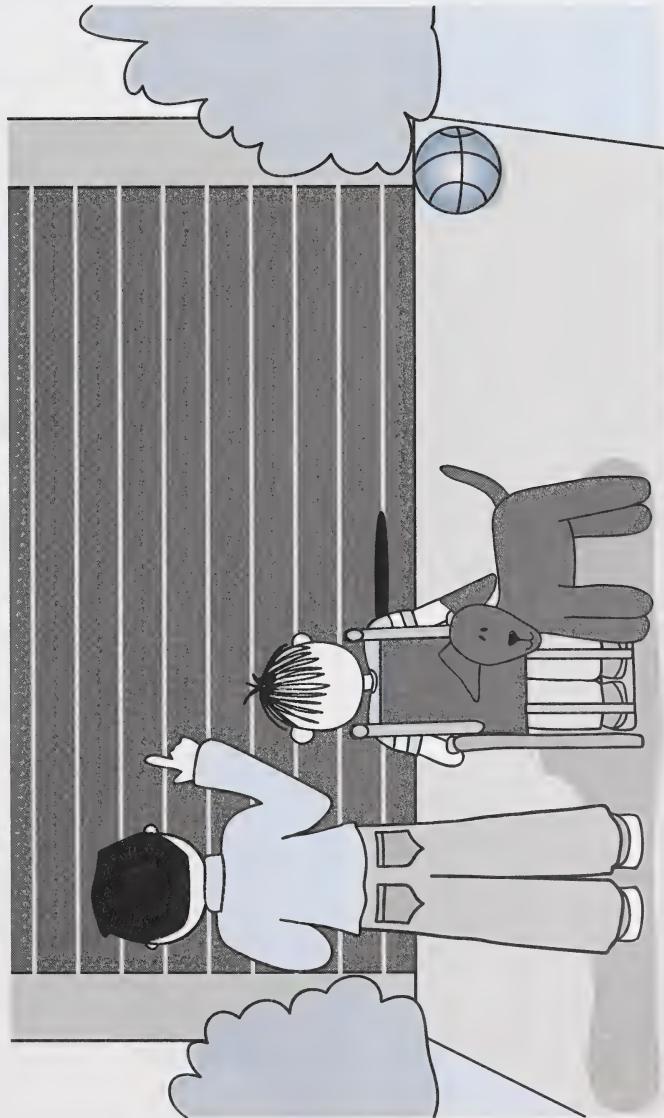


COMPARING PERIMETER AND AREA

LESSON 1

Luke's dad wants to build a new garage. He has enough materials to make a garage with a perimeter of 100 metres. He wants to have as much space as possible inside.

Luke decided to make models of shapes for the garage to help his dad figure out how long to make the sides.



The purpose of this exercise is to help your student discover that the area inside a figure may vary even when the perimeter stays the same.

Find “Luke’s Garage Models” in the Appendix. Cut out each garage strip.

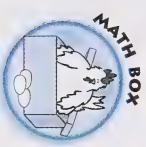
1. What do you notice about the length of each strip? _____

The strips you used for the models were the same length. That means the perimeter of each model is the same.

Fold each garage strip on the dotted lines and tape the two ends together to make rectangular models of the garage.

Even though the perimeter of each model is the same, the garage models make different-sized rectangles.

2. Do you think the space inside each rectangle is the same? _____

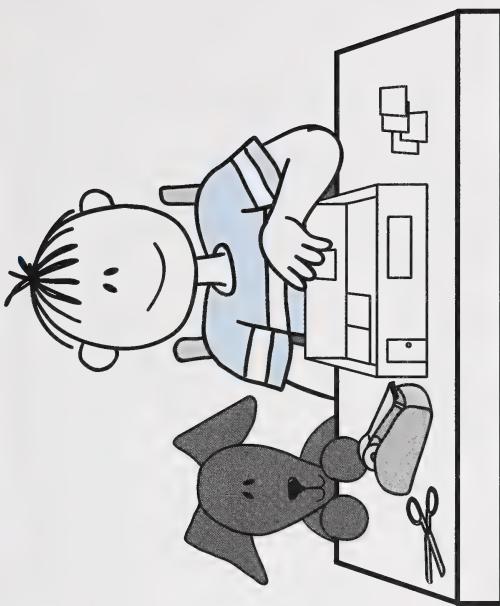


Take out your pattern blocks. Find the small square shapes. If you do not have pattern blocks, use the squares from the block cutouts.

Use the small square blocks to measure the area inside each garage model.



COMPARING PERIMETER AND AREA



3. Write down the area of each model.

a. The area of model 1 is _____ square units.

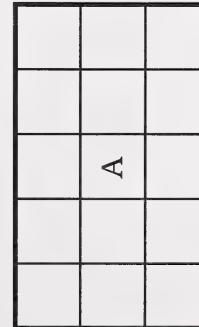
b. The area of model 2 is _____ square units.

4. Which model has the greater area? _____

The perimeter stayed the same for each model, but the area inside was different.

5. Luke's dad should build a garage shaped like model _____ to get the most space inside.

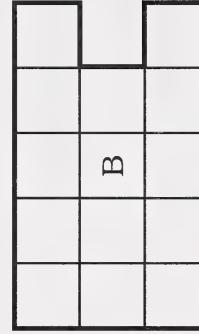
6. a. Find the perimeter and area for the shapes that follow:



Perimeter of A: _____ cm

Area of A: _____ square units

Which shape has the greater perimeter? _____ greater area? _____

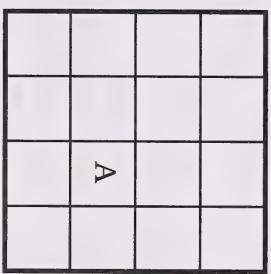


Perimeter of B: _____ cm

Area of B: _____ square units

Find the perimeter and area for the shapes that follow.

7. a.



Perimeter of A: _____ cm

Area of A: _____ square units

b. Which shape has the greater perimeter? _____ greater area? _____

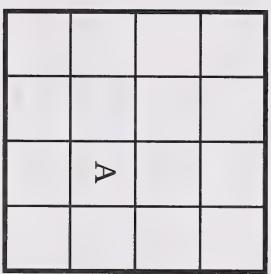
8. a.



Perimeter of A: _____ cm

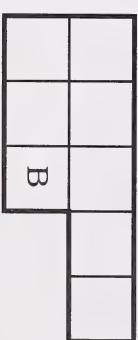
Area of A: _____ square units

Which shape has the greater perimeter? _____ greater area? _____



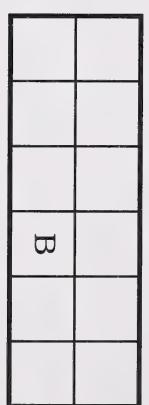
Perimeter of B: _____ cm

Area of B: _____ square units



Perimeter of B: _____ cm

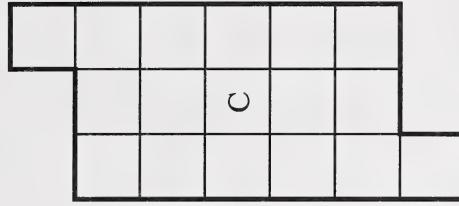
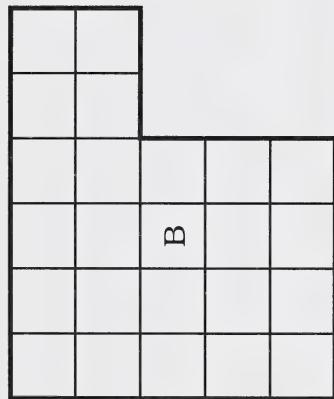
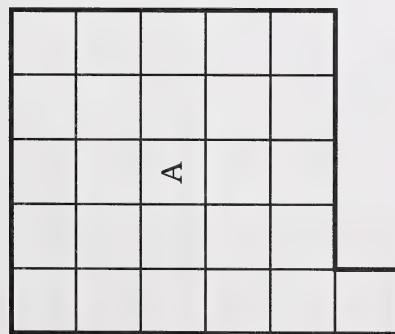
Area of B: _____ square units



COMPARING PERIMETER AND AREA

LESSON 2

Look carefully at the following shapes. Put an **X** (ex) on the shape you think has the **longest** perimeter. Put a **✓** (check mark) on the shape you think has the **greatest** area.



- Find the area and perimeter for each shape.

Shape A:

Perimeter: _____ units

Area: _____ square units

Were your estimates correct? _____

Shape B:

Perimeter: _____ units

Area: _____ square units

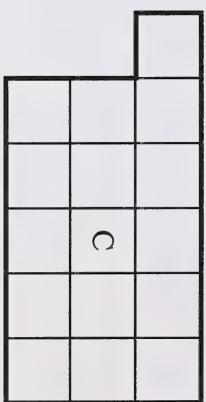
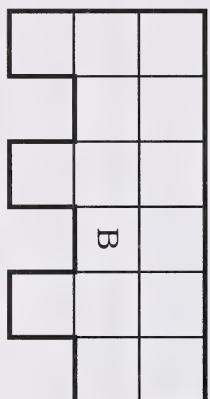
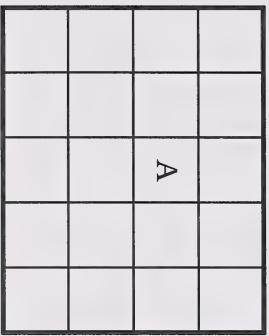
Shape C:

Perimeter: _____ units

Area: _____ square units



Look carefully at the following shapes. Put an **x** (ex) on the shape you think has the **longest** perimeter. Put a **✓** (check mark) on the shape you think has the **greatest** area.



2. Find the area and perimeter for each shape.

Shape A:

Perimeter: _____ units

Perimeter: _____ units

Perimeter: _____ units

Area: _____ square units

Area: _____ square units

Area: _____ square units

Were your estimates correct? _____

Shape B:

Perimeter: _____ square units

Area: _____ square units

Shape C:

Perimeter: _____ square units

Area: _____ square units



Go to Assignment Booklet 5A.



GRADE THREE MATHEMATICS

DAY 8: MORE ABOUT AREA

You found out that shapes with different areas can have the same perimeter. Have you noticed anything else about area?

Today, you may be surprised as you learn something more about area.



MODULE 5

LESSON 1

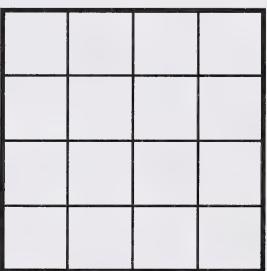
1. Find the area of each of the following shapes.

a.



Area: _____ square units

b.



Area: _____ square units

2. What do you notice about the area of these two shapes? _____



The shapes look very different
but they have the same area.



3. What is the area of this shape?



Area: _____ square units

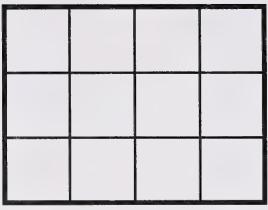
You can use a grid to make shapes that have a certain area.

Find and remove a page of the "Centimetre Grid Paper" in the Appendix.

4. From the centimetre grid paper, cut out a shape that has an area of 4 square units. Make the shape different from the one above.
Glue it here.

Observe your student during this activity. Some may choose to cut out four individual centimetre squares and then try to arrange them into a shape. Some students will colour in or outline the correct number of squares and then cut. Others will cut a 4-cm square shape directly.

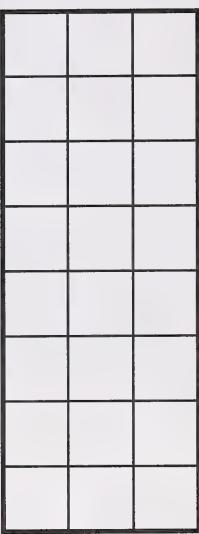
5. Find the area of the shape below. Use the grid paper to cut a different shape with the same area. Glue the new shape in the space to the right.



Area: _____ square units

6. For each of the following shapes, cut the grid paper to make a different shape that has the same area. Glue the new shapes in the space to the right.

a.



b.

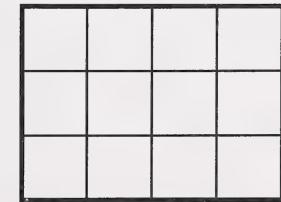




LESSON 2

You know that you can count the squares on a grid to help you find the area of a flat shape. Have you noticed that some grids make rectangles that look just like the arrays that you made for multiplication?

You can use what you know about multiplication and arrays to find the area of rectangles without counting each square.



1. Write a multiplication number sentence for this grid.

The multiplication number sentence means the same as 4 groups of 3 is 12 or 4 times 3 is 12.

The area of this rectangle is _____ square units.

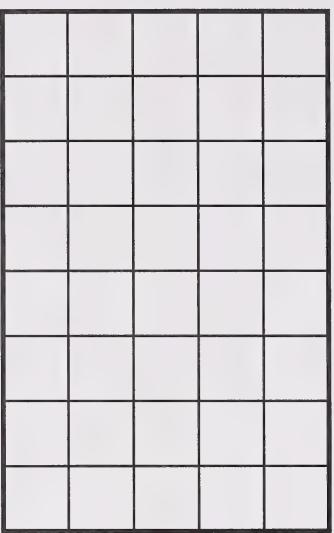


MODULE 5

2. Write the multiplication number sentence or fact for each array to find the area. Then complete the sentence.

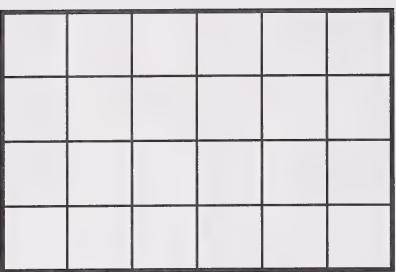
a. _____

The area is _____ square units.



b. _____

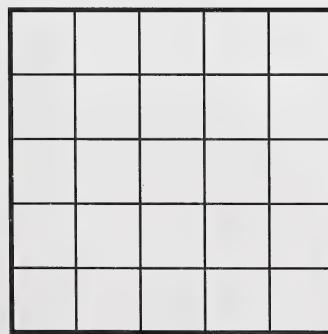
The area is _____ square units.



c. _____

The area is _____ square units.





d. _____

The area is _____ square units.



For more practice with measurement, perimeter, or area try the following website.

http://mathforum.org/vannelle_krods.html

You can use virtual rods in a variety of measurement activities.

Are you ready for your timed exercise? Ask your home instructor to time you for 2 minutes and to mark your answers. Remember to record your score here and on your Math Facts Graph from the Appendix.



TIMED EXERCISE: 2 MINUTES

$7 \times 4 = \underline{\hspace{1cm}}$

$0 \times 8 = \underline{\hspace{1cm}}$

$9 \times 3 = \underline{\hspace{1cm}}$

$1 \times 6 = \underline{\hspace{1cm}}$

$8 \times 4 = \underline{\hspace{1cm}}$

$4 \times 3 = \underline{\hspace{1cm}}$

$9 \times 5 = \underline{\hspace{1cm}}$

$3 \times 2 = \underline{\hspace{1cm}}$

$6 \times 6 = \underline{\hspace{1cm}}$

$2 \times 4 = \underline{\hspace{1cm}}$

$7 \times 5 = \underline{\hspace{1cm}}$

$8 \times 2 = \underline{\hspace{1cm}}$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$$

$$\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$$



Go to Assignment Booklet 5A.

Number completed	
Number correct	



DAY 9: PROBLEM SOLVING

Understanding measurement can help you solve many everyday problems. Did you ever have to figure out how many centimetres long you need to cut a board to make a birdhouse or how many kilometres it is to the next town?

In Day 9, you will use what you have learned about measurement to solve word problems.

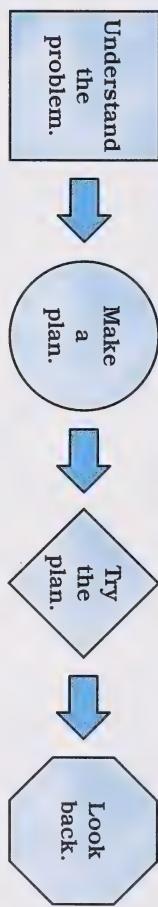


LESSON 1

When you do problems using measurement, you often need to add, subtract, multiply, or divide to find the answer. You also need to decide what units to use.

Students often figure out the answer correctly but forget to indicate the unit of measurement being used. Stress the importance of indicating the measurement unit.

Remember to check for clues in the problem. If the question asks how long something is, you will use units like centimetre, decimetre, metre, or kilometre in your answer. If the problem is about area, you will use square units. If the question asks how long something will take, you will use minutes, hours, or days.



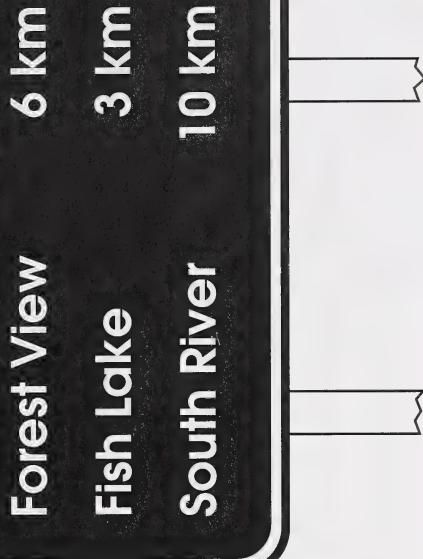
Use the problem-solving steps to solve each problem that follows. Watch for the words that tell you what operation you will need to do. Think about the strategies you have learned to help you solve problems. You can

- act out a problem
- draw a picture or diagram
- make an organized list or a chart
- find a pattern



Show your work. Write the answer in a sentence.

1. This is a sign near Sarah's house. Sarah can ride 1 km in 5 minutes on her bike.
 - a. How long would it take Sarah to ride her bike to Forest View?
 - b. How long would it take Sarah to ride her bike to Fish Lake?



c. How much farther is it to South River than it is to Fish Lake?

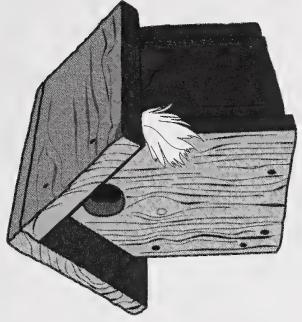
d. If Sarah rode to South River and back again, how many kilometres would she have gone?



PROBLEM SOLVING

2. Luke and his dad are building a birdhouse. They will use some leftover boards Luke found in the garage.

For the walls, they need to cut 4 pieces that are each 20 centimetres long. For the roof, they need to cut 2 pieces that are each 22 centimetres long.



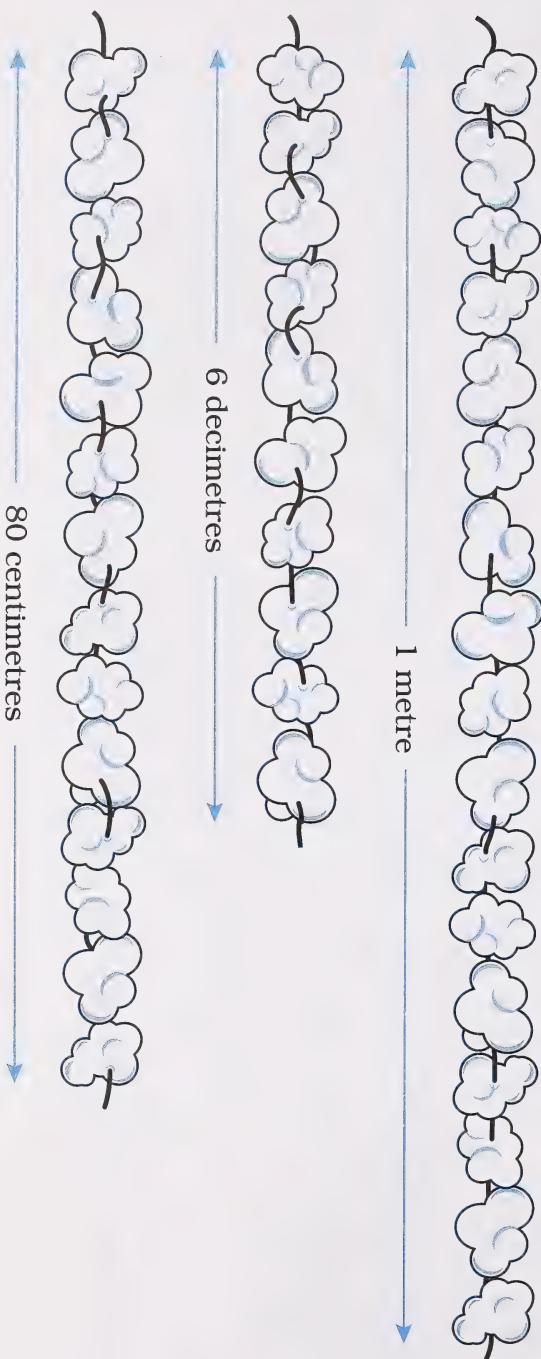
a. Luke found a board in the garage that is 85 cm long. Will this board be long enough to make all the walls for the birdhouse?

b. There is another board that is 40 cm long. Is it long enough for the roof pieces?

LESSON 2

Do you know how to find the answer to a problem when the given units of measurement are different?

Luke was going to feed the birds in a tree in his yard. He threaded some popcorn onto three strings. Luke and his mom measured the strings.



How long are the three strings altogether?



PROBLEM SOLVING

Understand
the
problem.

1. What do you have to find out?

Make
a
plan.

2. Will you need to add, subtract, or multiply to find the answer?

You must change all the measurements to the same units before you can add, subtract, or multiply.

3. To change all the string measurements to centimetre units, you must remember that

- 1 metre = 100 cm
- 1 decimetre = 10 cm

a. The string that is 1 metre is _____ cm.

b. The string that is 6 decimetres is _____ cm.

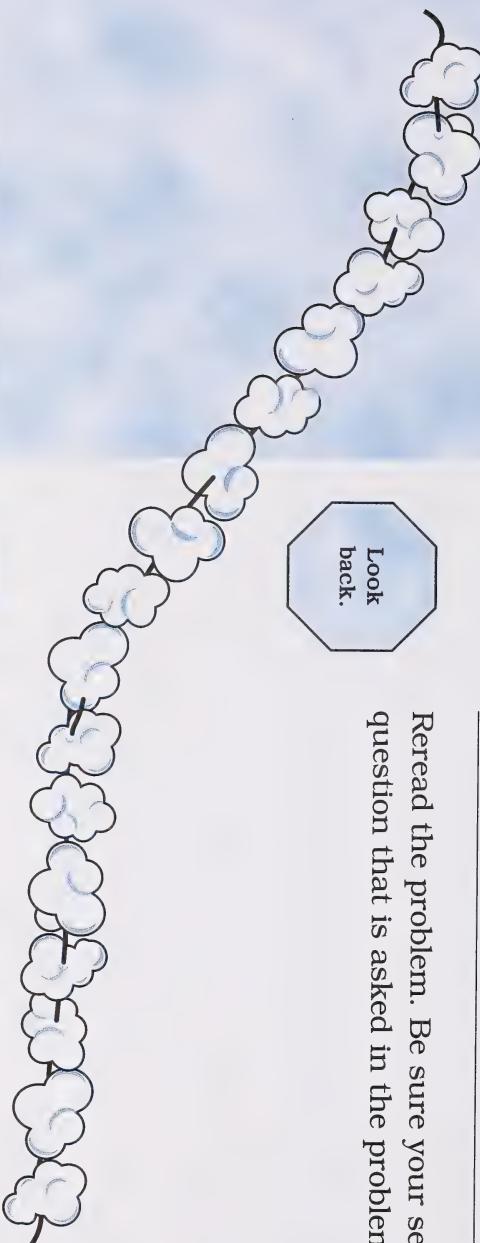
4. You have found all the measurements of the strings in centimetres. Now you can solve the problem. Show your work.

Try
the
plan.



MODULE 5

5. Write a sentence to answer the question in the problem. Be sure to use the word **centimetres** to describe the total length.



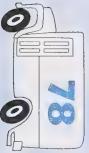
Look back.

Reread the problem. Be sure your sentence answers the question that is asked in the problem and makes sense.

After the student completes the work in the Assignment Booklet, fill in the Home Instructor's Checklist and add any comments you have that may be helpful to the teacher.



Go to Assignment Booklet 5A. When you finish the assignment for today, you will complete the Student's Checklist and fill out the Student's Comments before submitting your work to your teacher.



DAY 10: HOW MUCH DOES IT HOLD?

In today's activities, you will explore estimating and measuring how much a container holds.

You will also think about the best unit of measurement to use for different tasks.



DAY 10

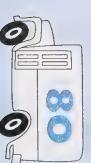
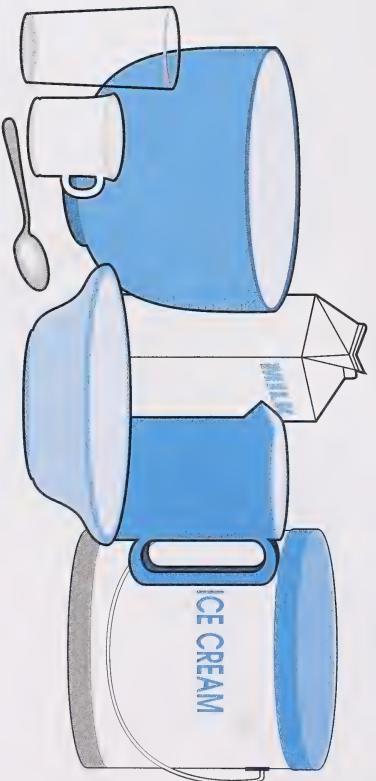
If your student has trouble thinking of tools for measuring capacity, remind him or her of cooking experiences. What was used to measure butter, milk, syrup, or other ingredients?

When you find out how much a container holds, you are measuring **capacity**. Capacity often involves measuring a liquid.

1. List three tools you have used to measure liquids.

Find the following eight different-sized items for measuring:

- large serving bowl
- ice-cream pail or water pail
- empty milk container
- teaspoon or soupspoon
- coffee cup
- juice pitcher
- cereal bowl
- drinking glass

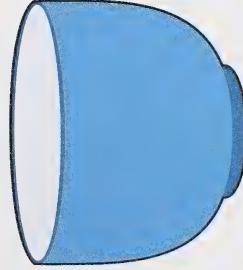


HOW MUCH DOES IT HOLD?

Take your containers to a sink or bathtub. Ask your home instructor for a towel or cloth you can use to wipe up spills and to dry your hands.

Find the large serving bowl. Find the drinking glass.

Fill the glass to the top with water and empty it into the bowl. Count how many glasses of water it takes to fill the bowl. Measure to the nearest glass.



Your student will measure the capacity of a variety of containers in this activity. Allow the student to use a sink or bathtub and provide a towel or cloth to wipe up spills. Monitor the student as necessary.

In capacity, like linear measurement, the student should measure to the nearest unit. If it takes less than half a glass to fill the container, the count should be the previous number. If it takes more than half a glass, the count should go to the next number.

2. The large bowl holds _____ glasses of water.
3. Which of the other containers could you use to find out how much water the bowl will hold?

Since the answers will vary in this question and following questions, you may want to observe your student's measuring and check the answers of each question as the activity progresses.

4. The bowl holds _____ number _____ container you chose



When you are measuring how much a container holds, you need to choose a suitable unit. Would you like to measure how many teaspoons of water there are in the serving bowl? Could you use an ice-cream pail to measure the capacity of the bowl? The larger the container, the larger the unit of measurement you can use.

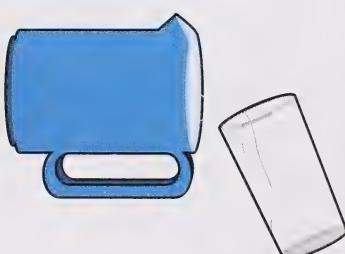
5. Use the drinking glass and water to measure the capacity of each container.

a. The coffee cup holds _____ glass(es).

b. The juice pitcher holds _____ glass(es).

c. The cereal bowl holds _____ glass(es).

d. The milk container holds _____ glass(es).



6. Of the eight different-sized items, which one would you use to measure the capacity of the ice-cream pail?

7. Of all eight different-sized items, which one would you use to measure the capacity of the glass?



HOW MUCH DOES IT HOLD?

8. Estimate, and then use the cereal bowl to measure the amount of water each container will hold.

How Many Cereal Bowls?

Object	Estimate	Actual
juice pitcher		
milk container		
ice-cream pail		
large serving bowl		

9. Which container above held the most water? _____

10. Which container above held the least water? _____

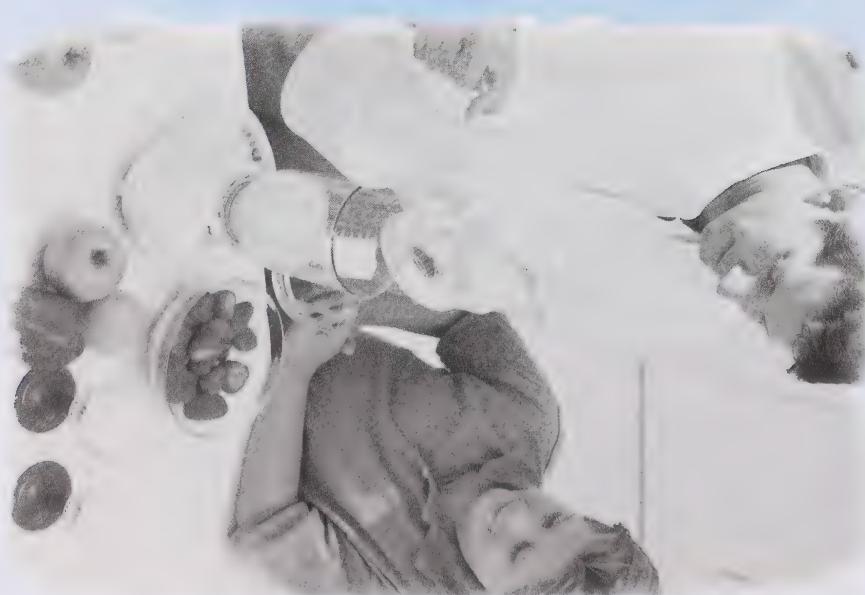


MODULE 5

DAY 11: USING LITRES

In Day 10, you used a variety of containers to measure capacity. Today, you will use litres to measure how much liquid a container will hold.

Can you think of something that comes in a litre container?

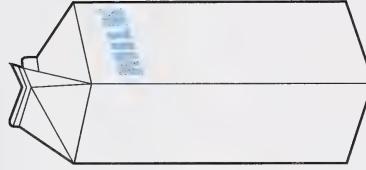


USING LITRES

A **litre** is a standard measurement used to measure and tell about capacity. People have agreed exactly how much a litre is. Many liquid products are measured in litres.

The short way of writing litre is **L**.

1. Look in your kitchen cupboard and fridge. Find three products that are measured in litres.



Take out your litre container.

Find the drinking glass that you used on Day 10.

2. How many glasses of water do you think the litre container will hold? _____
3. Use the glass to fill the litre container. How many glasses of water did it take to fill the litre container? _____

Find the ice-cream pail, large serving bowl, juice pitcher, and milk container that you used on Day 10.

4. Which of these containers do you think holds about 1 litre? _____
5. Use your litre container to measure the capacity of each of the following containers. Measure to the closest litre.

a. ice-cream pail _____ L

b. juice pitcher _____ L

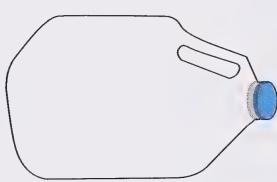
c. serving bowl _____ L

d. milk container _____ L

6.



This juice pitcher holds 1 litre.



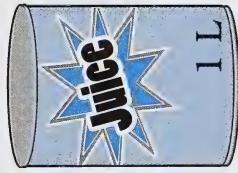
This milk jug holds 4 juice pitchers.



This pail holds 2 milk jugs.



7. This 1-litre juice can holds 4 glasses of juice.



a. How many glasses are there in 3 cans of juice? _____

b. How many glasses are there in 5 cans of juice? _____

c. A teacher pours 24 glasses of juice for her class. How many 1-litre cans of juice will she need? _____



Go to Assignment Booklet 5B.

DAY 12: COMPARING CAPACITY

Sometimes you can tell which holds the most just by looking at the size of the containers. At other times it is difficult to tell, and you have to measure.

How many buckets are needed to fill the feeder?

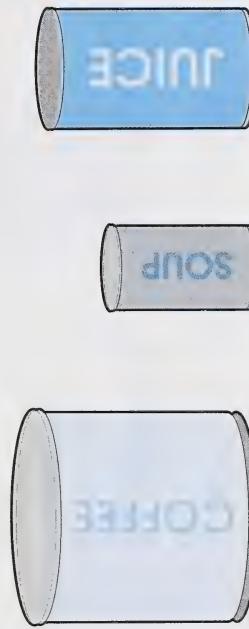
Get ready to do some measuring, comparing, and ordering.



COMPARING CAPACITY

You can often look at the size of two or more containers and tell which holds the most.

Find three different-sized cans in your kitchen cupboards.



Which can do you think holds the most? Which can do you think holds the least? Tell your home instructor.

Put the cans in a row from greatest capacity to least capacity. Show your home instructor.

Any three different-sized cans will be fine for this activity.

After the student has compared the objects visually, you may wish to show the student the actual capacity of each can as written on the label. The student has not been formally introduced to millilitres but will understand the amounts in comparison. For example, if one can is 540 ml and another is 400 ml, the student can readily see that one has a higher number and therefore must hold more.



I like doing this activity with four or five containers. You might enjoy that too!

1. Look at the pictures below.



a. Which container do you think holds the most?

b. Which container do you think holds the least?

You may wish to do more of this type of activity with your student.

c. Write the names of the containers in order from greatest capacity to least capacity.



COMPARING CAPACITY

Sometimes it is difficult to tell which container will hold more. You can measure to find out.

Your home instructor will show you three containers.

2. a. Which container do you think will hold the most?

b. Which do you think will hold the least?

3. Find a drinking glass. Use the glass to measure how much each of the containers will hold.

Container 1: _____ glasses



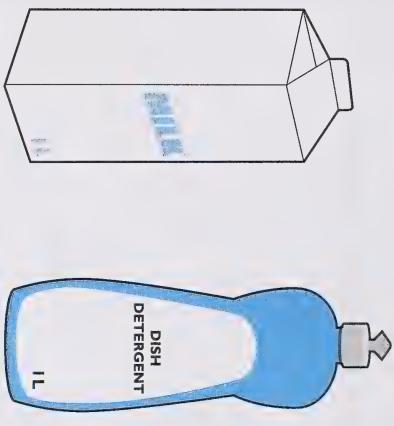
Container 2: _____ glasses

Container 3: _____ glasses

4. a. Which container held the most?

b. Which container held the least?





Often products that you buy have the capacity written on the label. When you looked at different products on Day 11, you probably noticed the numbers that told how much each container held.

You can use the capacity written on the label to help you make good choices when you shop.

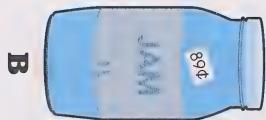
Look at the jars to the right. The labels tell you that these two jars of jam hold the same amount. The price is different.

5. If both jars of jam tasted the same, which jar would you buy? _____

Why? _____



A



B

Go to Assignment Booklet 5B.



DAY 13: MEASURING MASS

Have you ever watched as someone weighed some fruit in a grocery store? That person was measuring the mass of the fruit. Did you notice what unit of measurement was used?

Find out more about measuring the mass of objects in today's lesson.



LESSON 1

When you weigh an object, you are measuring its **mass**. Mass is the amount of matter in an object. You will learn in science that all objects are made up of matter.

Kilograms and **grams** are used to measure mass. You may see kilograms shortened to **kg** and grams shortened to **g**.



Take out your litre container.

Put 1 litre of water in the container. Lift up the container. Your container of water weighs about 1 kilogram.

1. List three things in your home that you think weigh about 1 kilogram.

Hint: Hold your container of water in one hand and the object in the other hand. Does the object weigh about as much as the container of water?

My book feels less than 1 kilogram.



MEASURING MASS

2. Find each of the objects listed below. Pick up each item and your container of water. Mark a (check) in the correct box to show if you think the object is more than a kilogram, less than a kilogram, or about a kilogram.

Object	More Than a Kg	Less Than a Kg	About a Kg
pencil			
a full 1-litre milk or juice carton			
chair			
thick, hardcovered book			
stapler			

A kilogram is useful for weighing heavy objects. Your doctor probably weighs you in kilograms!

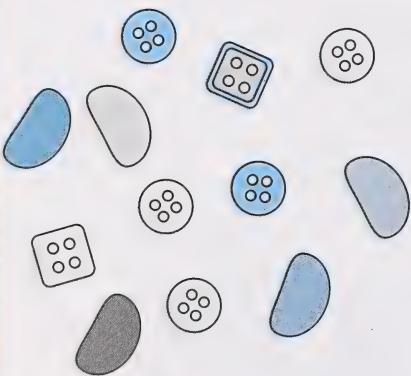
When an object is lighter than a kilogram, it is weighed in grams. There are 1000 grams in a kilogram. Did you remember from Day 1 that **kilo** means 1000?

$$1 \text{ kilogram} = 1000 \text{ grams}$$

A gram is about the same mass as a jellybean, a small button, or a ones block from your base ten blocks.

3. Pick up a jellybean, a button, or a ones block. Find something else in your home that is about 1 gram.

A _____ has a mass of about 1 g.



MEASURING MASS

4. Would you use kilograms or grams to measure the mass of each real-life object shown in the chart?

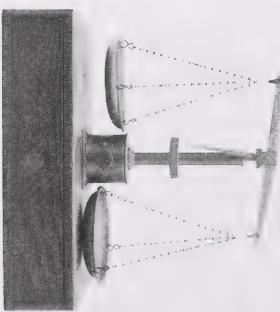
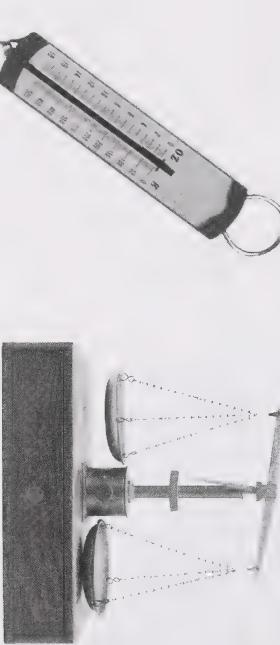
Object	Grams or Kilograms?
eraser	
child	
package of gum	
large box of oranges	
marble	
sofa	

If the student is having difficulty selecting the appropriate unit, have an item weighing a kilogram and another weighing a gram available for reference.

LESSON 2

You may have a kitchen scale and bathroom scale in your home. You may wish to demonstrate these to your student. The produce scale in a grocery store can also be used.

To get an exact measurement of mass, you must use a scale. There are many different kinds of scales.



If the student does not have standard weights, the container of water may be used as a kilogram measure. Small buttons or ones blocks from the base ten blocks may be used to measure grams.

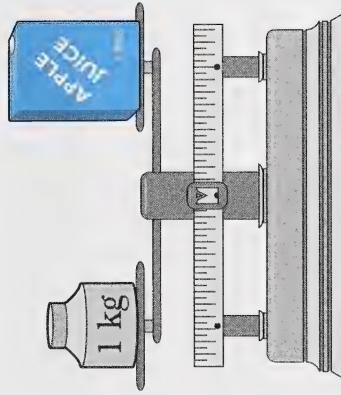


Take out your balance scale. If you have kilogram and gram weights, take them out too.



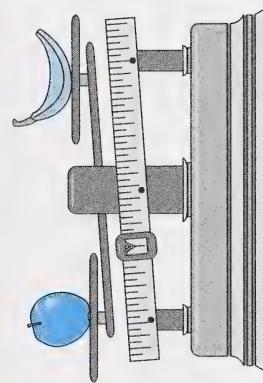
MEASURING MASS

You can use a balance scale and weights to measure objects. When the pans on a scale are balanced, the masses of the two objects are the same.



The mass of the juice is 1 kilogram.

When one side of the balance scale is down, that object has more mass than the other.

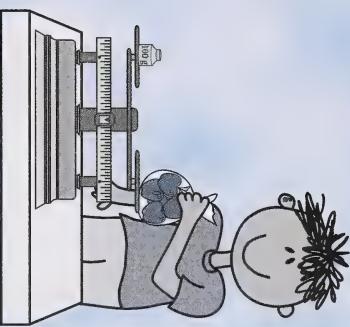


In this example, the mass of the apple is greater than the mass of the banana.

If you do not have the listed products, substitute any available produce.

Ask your home instructor if you can weigh some apples, oranges, potatoes, or other fruits and vegetables.

Put your 1-kilogram weight on the scale. Put fruit or vegetables in a plastic bag. Add them one at a time until you make the scale balance.



1. How many of each fruit or vegetable does it take to equal the 1-kilogram weight?

a. apples _____ b. oranges _____
 c. potatoes _____ d. your choice _____

If you have a set of kilogram and gram weights, you can find the exact mass of an object.

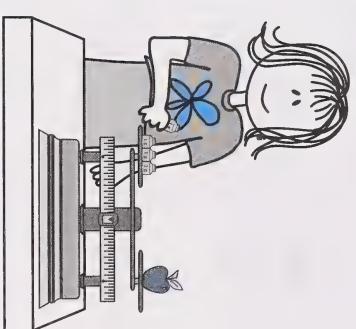
Put one apple on the balance scale.

2. Will you weigh the apple in kilograms or grams? _____

If you do not have standard weights, use the ones blocks from the base ten blocks. Use rods for 10 grams, and use flats for 100 grams.

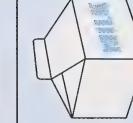
You may need several weights to equal the mass of the apple.

3. The mass of an apple is _____ g.



MEASURING MASS

4. Find the mass of each of the objects in real life. Use your kilogram or gram weights. You may need some of both.

Object	Kilograms	Grams
cereal box		
cup of sugar		
milk container		
can of soup		
egg		
your choice		

Assist your student to find alternative items if you do not have access to any of the given items. Is your student making the correct choice of weights for measuring the various masses?

Space is provided for the student to choose an extra item. Observe the student's choice of weights for measuring that object.



MODULE 5

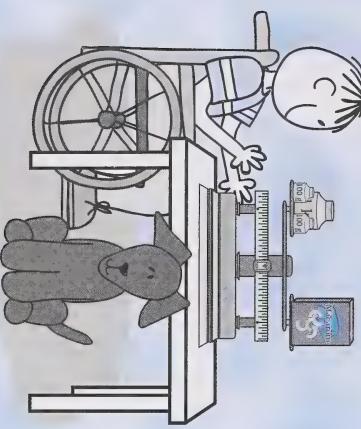
If necessary, help your student look for kg or g on the labels.

Many products in your home are labelled with the kilogram or gram mass.

- Find two products where the mass is labelled in kilograms.

- Find two products where the mass is labelled in grams.

The mass of the macaroni box is 1 kilogram and 200 grams.



EXTENSION ACTIVITY

You may enjoy looking for different types of scales the next time you are shopping or doing errands. The post office, the pharmacy, the health-food store, the feed store, and the grocery store may all have different types of scales. You may discover what units each of these scales use.



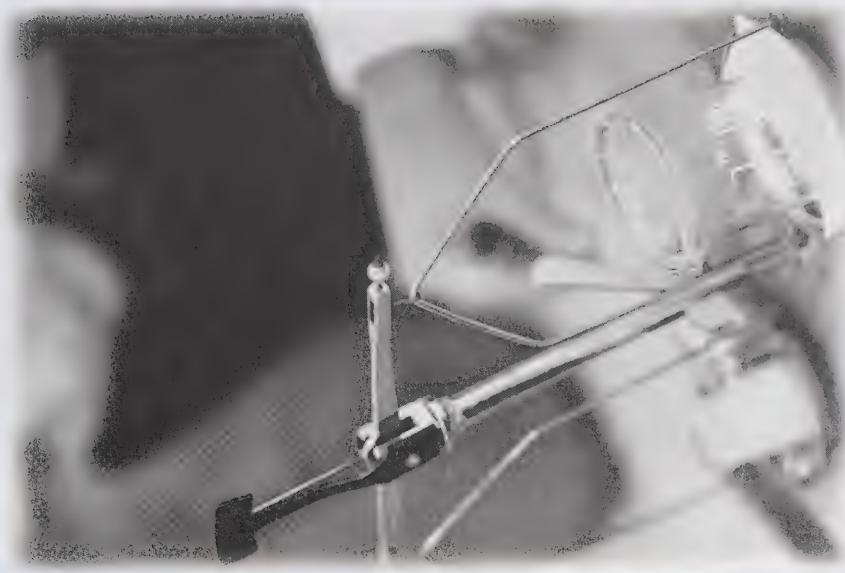
Go to Assignment Booklet 5B.



DAY 14: COMPARING MASS

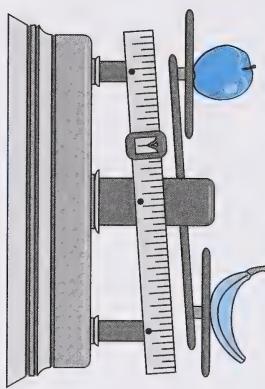
In Day 13, you learned how to measure the mass of an object.

Today's activities will give you a chance to compare different objects by mass. You will also practise ordering objects by their mass.



LESSON 1

When you compare the mass of two objects, you think about which object is lighter or heavier. It is easy to compare the mass of two objects on a balance scale.



You can tell that the apple is heavier than the banana because the pan holding the apple is down.



Take out your balance scale.

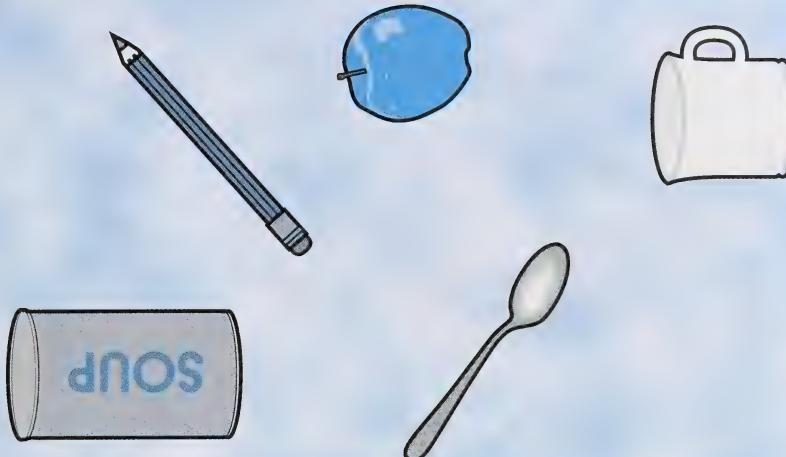
If you do not have the specified item, substitute an item that is available.

Find a pencil, a coffee cup, a spoon, an apple, and a can of soup.



COMPARING MASS

1. Estimate which object in each pair is heavier and write it in. Then use your balance scale to find out if you were right. Make a ✓ (check) if you were correct.



Which Is Heavier?

Objects	Estimate	Weight with the balance scale
pencil or apple		
coffee cup or a can of soup		
spoon or a pencil		
apple or a can of soup		
coffee cup or an apple		

If you are comparing the mass of several objects and putting them in order, you may need to find the exact weight of each.



Take out your gram weights.

If you do not have gram weights, small buttons or the ones blocks from your base ten blocks may be used.



MODULE 5



2. Use your gram weights to find the mass of each object.

a. pencil _____ g

b. apple _____ g

c. coffee cup _____ g

d. spoon _____ g

e. can of soup _____ g

3. a. Which object in this group was lightest? _____

b. Which object was heaviest? _____

c. List the objects in order from lightest to heaviest.

LESSON 2

Sometimes you may use information on labels, graphs, or charts to compare or order the mass of objects.



Some of these packages are measured in kilograms and some are measured in grams. In order to compare the items by mass, you need to change the kilograms into grams.

Remember, 1 kilogram = 1000 grams.

If the mass of a package is 2 kilograms, that is the same as 2000 grams.

1. Change the packages labelled in kilograms to grams.

Coffee: 1 kg = _____ g

Sugar: 5 kg = _____ g

2. Now list the products in order from heaviest to lightest.

The chart below tells you the mass of some animals.

Animal	Average Mass
polar bear	350 kg
sea turtle	125 kg
gorilla	180 kg
tiger	120 kg



COMPARING MASS

3. List the animals shown in the chart in order from lightest to heaviest.



The largest animal is the blue whale. The mass of an adult is about 130 000 kg!

Are you ready for your timed exercise? Ask your home instructor to time you for 2 minutes and to mark your answers. Remember to record your scores here and on your Math Facts Graph from the Appendix.

TIMED EXERCISE: 2 MINUTES

$4 \times 7 = \underline{\hspace{1cm}}$

$3 \times 6 = \underline{\hspace{1cm}}$

$8 \times 5 = \underline{\hspace{1cm}}$

$4 \times 8 = \underline{\hspace{1cm}}$

$6 \times 4 = \underline{\hspace{1cm}}$

$9 \times 3 = \underline{\hspace{1cm}}$

$7 \times 7 = \underline{\hspace{1cm}}$

$5 \times 4 = \underline{\hspace{1cm}}$

$6 \times 8 = \underline{\hspace{1cm}}$

$6 \times 6 = \underline{\hspace{1cm}}$

$3 \times 7 = \underline{\hspace{1cm}}$

$1 \times 5 = \underline{\hspace{1cm}}$

$$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$$



Go to Assignment Booklet 5B.

Number completed	
Number correct	



DAY 15: MEASURING TIME

You have learned how to measure many different things in this module. Have you ever thought about how time is measured? What units are used to measure time?

Find out more about time in today's activities!



MODULE 5

DAY 15

LESSON 1

1. List at least five units used to measure time. (Hint: Think about what clocks and calendars measure.)

Calendars are used to measure long periods of time. Look at a calendar in your home. Use your calendar or the one below to help you with the questions.

January 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
		1	2	3		
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

March 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

May 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

November 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

December 20XX						
Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



MEASURING TIME

2. How many months are in a year?

3. Write the months of the year in order, starting with January.

If the student cannot spell the months of the year and the days of the week you may wish to add these words to any spelling lists the student is practising. These are high frequency words and the student should be able to spell them independently by the end of grade three.

4. How many days are in a week?

5. Write the days of the week in order, starting with Sunday.

Listen to your student read the months of the year and days of the week. If the student cannot read them accurately, provide extra practice.

Read the days of the week and months of the year to your home instructor.



MODULE 5

If you counted all the days on the calendar, you would find that there are 365 days in most years. Once every 4 years is a special year called a **leap year**. A leap year has 366 days. An extra day is added to February.

Sarah is looking at her calendar for November. Use Sarah's calendar to answer the questions below.

6. a. What day of the week is November 15?

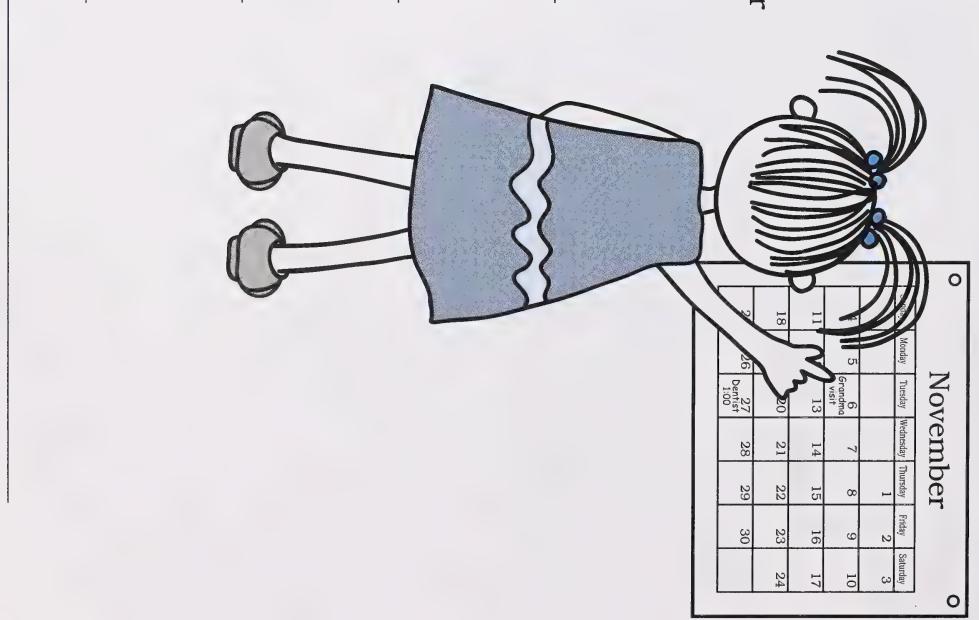
b. What date is Grandma coming to visit?

c. How many days are in November?

d. How many weeks after Grandma's visit is Sarah's dentist

appointment? _____

e. What day of the week is the last day of the month? _____



LESSON 2

Clocks are used to measure shorter units of time, like hours, minutes, and seconds. A second is a very short period of time. A minute has 60 seconds. An hour has 60 minutes.

$$1 \text{ minute} = 60 \text{ seconds}$$

$$1 \text{ hour} = 60 \text{ minutes}$$

1. Write the best unit (a **second**, a **minute**, an **hour**, a **day**, a **month**, or a **year**) to measure each task.

a. count to 100

b. wait from one birthday to the next

c. watch two cartoon shows on TV

d. snap your fingers

e. work from daylight to daylight

f. drink a glass of milk



Time lines are sometimes used to help show the passage of time.

A time line is like a number line but it shows minutes, hours, days, months, or years instead of numbers.

This time line shows some things Luke did last year.



2. Use the time line to answer these questions in a sentence.

- When was Luke's school break? _____
- How long was Luke in the hospital? _____
- When did Luke go on a trip? _____
- What did Luke spend the most time doing? _____
- When did vacation begin? _____



Go to Assignment Booklet 5B.



GRADE THREE MATHEMATICS

DAY 16: WHAT TIME IS IT?

Family swim time at the pool near Julie's house is from seven o'clock to eight o'clock. Julie likes to be on time.

Can you look at a clock and tell what time it is? In today's lesson, you will learn how to read time on a digital clock. You will also practise writing time and working with time schedules.

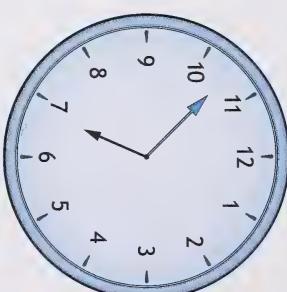


LESSON 1

There are two types of clocks or watches used to measure time. These clocks are showing the same time.



Digital Clock



Analog Clock

Analog clocks are introduced in Grade Four Mathematics. In grade three, students are expected to tell time using a digital clock.

Analog clocks use movable arrows called hands to show time. You will learn how to tell time on an analog clock in Grade Four Mathematics.

Most digital clocks and watches have electronic numbers that change as time passes. Look around your home for digital clocks.

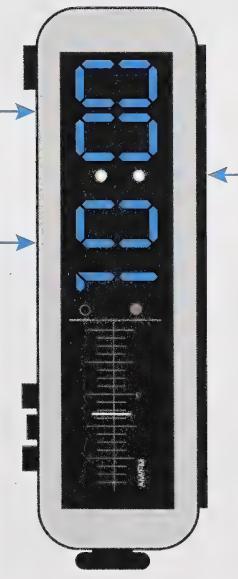
1. Write down where you find digital clocks in your home.



WHAT TIME IS IT?

The numbers on a digital clock show you the time.

These numbers tell the hour. These numbers tell the minutes.



Two dots separate the hours from the minutes.

The time on the clock above is read ten o'clock. When there are 0 minutes, the time is read as o'clock.

2. Read the time on the watches and clocks below to your home instructor.

Ask the student to read the times aloud to you.

- a.
- b.
- c.
- d.

Remember that these numbers tell the hour. These numbers tell the minutes.



The time on the clock above is read two fifteen. It means that it is 15 minutes past 2 o'clock.



The time on the clock above is read seven "o" four. It means that it is 4 minutes past 7 o'clock.



I read this clock as ten thirty. It means that it is 30 minutes past 10 o'clock.



WHAT TIME IS IT?

3. Read the time on the watches and clocks below to your home instructor.

Ask your student to read the times aloud to you.



You know that there are 60 minutes in one hour. The minutes on a digital clock count up to 59, then change back to 00.

If you have a digital clock, show the student how the time changes to the next hour after fifty-nine minutes. Have the student tell you the upcoming hour.



One minute later, the time changes to 11 o'clock.



This clock shows 10:59 or 59 minutes past 10 o'clock.



MODULE 5

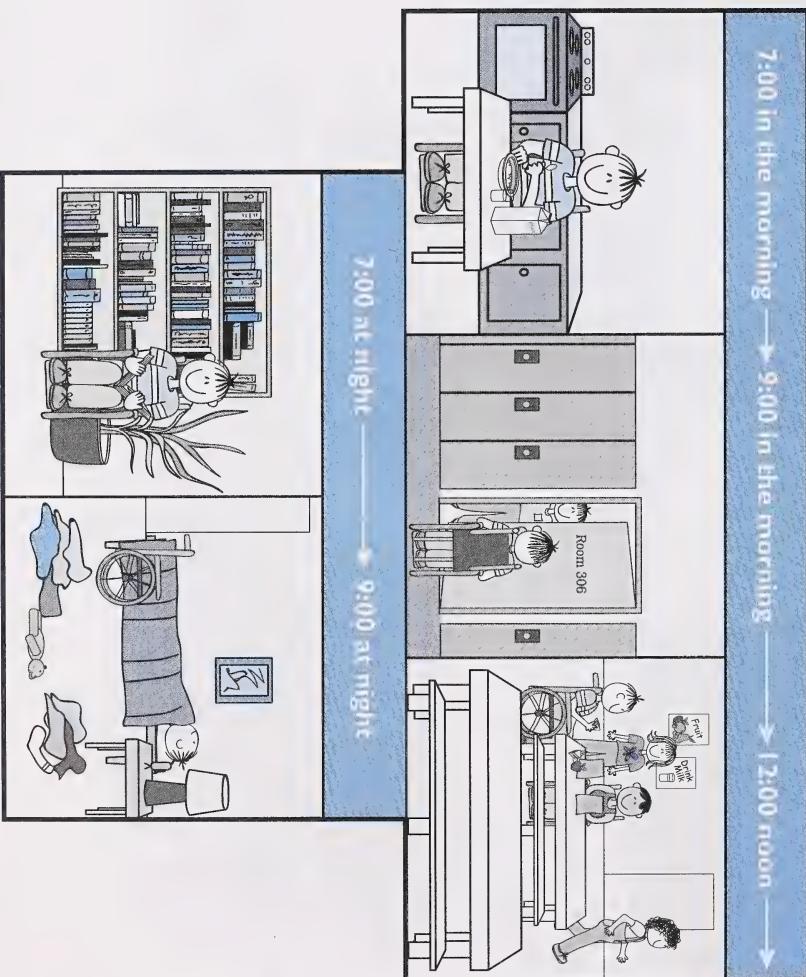
DAY 16

You may wish to draw attention to the times your student does various daily tasks. Have the student practise reading the times aloud. You might also ask the student what activity he or she would be doing at the opposite time. For example, if lunch is at eleven thirty in the morning, ask "what will you be doing at eleven thirty at night?"

Students may have difficulty with the change from 12:59 to 1:00. This concept may require extra practice.

There are 24 hours in a day. Most clocks show only 12 hours and 59 minutes, then the count starts over. After 12:59, the clock shows 1:00 again. So, each time will appear twice in one day.

Midnight is 12:00 and so is noon. There is a 6:00 early in the morning and another 6:00 in the evening.



WHAT TIME IS IT?

4. Read the clocks below and write the time in numbers on the lines. Be sure to put the two dots (:) between the hours and the minutes. Then write the time in words.



or _____

or _____

or _____

b.



or _____



or _____

d.



or _____



5. Write the time in words.

Have your student read each time aloud. This should help in writing out the time.

Example: 5:21

five twenty-one

or twenty-one minutes past 5 o'clock

a. 12:32

or

b. 3:05

or

c. 6:12

or

d. 7:00



LESSON 2

Schedules can be used to help plan your time. On school days, do you follow a daily schedule like Luke?

Luke's Schedule

Time	Activity
7:00 to 7:30	getting ready
7:30 to 8:00	breakfast
8:00 to 8:45	on school bus
8:45 to 12:00	school
12:00 to 1:00	lunch
1:00 to 3:30	school
3:30 to 4:00	on school bus
4:00 to 6:00	free time or basketball
6:00 to 7:00	supper
7:00 to 9:00	TV and reading
9:00	bedtime



Use Luke's schedule to answer the questions.

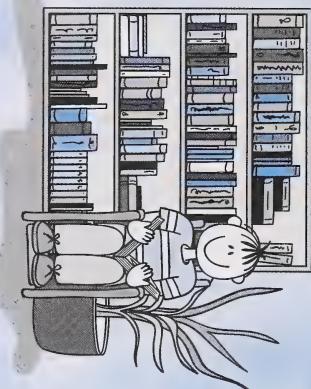
1. What time does Luke start school in the morning?

2. When is Luke's supper?

3. How many hours of free time does Luke have?

4. What time does Luke go to bed?

5. How much time does Luke spend getting ready in the morning?



Are you ready for your timed exercise? Ask your home instructor to time you for 2 minutes and then to mark your answers. Remember to record your scores here and on your Math Facts Graph from the Appendix.



TIIMED EXERCISE: 2 MINUTES

$$4 \times 3 = \underline{\quad}$$

$$3 \times 5 = \underline{\quad}$$

$$8 \times 2 = \underline{\quad}$$

$$4 \times 4 = \underline{\quad}$$

$$6 \times 5 = \underline{\quad}$$

$$9 \times 6 = \underline{\quad}$$

$$7 \times 2 = \underline{\quad}$$

$$5 \times 1 = \underline{\quad}$$

$$6 \times 6 = \underline{\quad}$$

$$6 \times 7 = \underline{\quad}$$

$$3 \times 7 = \underline{\quad}$$

$$0 \times 8 = \underline{\quad}$$

$$8 \times 5 = \underline{\quad}$$

$$6 \times 3 = \underline{\quad}$$

$$2 \times 2 = \underline{\quad}$$

$$4 \times 6 = \underline{\quad}$$

$$9 \times 1 = \underline{\quad}$$

$$5 \times 7 = \underline{\quad}$$

$$6 \times 2 = \underline{\quad}$$

$$3 \times 8 = \underline{\quad}$$

$$7 \times 4 = \underline{\quad}$$

$$4 \times 5 = \underline{\quad}$$

$$5 \times 9 = \underline{\quad}$$

$$9 \times 3 = \underline{\quad}$$

$$3 \times 3 = \underline{\quad}$$

$$6 \times 3 = \underline{\quad}$$

$$9 \times 1 = \underline{\quad}$$

$$5 \times 7 = \underline{\quad}$$

$$9 \times 5 = \underline{\quad}$$

$$9 \times 3 = \underline{\quad}$$



Go to Assignment Booklet 5B.

Number completed	
Number correct	



MODULE 5

DAY 17: MORE PROBLEM SOLVING

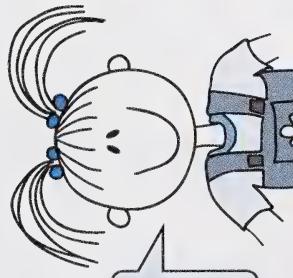
Each day you use measurement skills. How do you use measurement skills when shopping?

Today, you will use what you have learned about capacity, mass, and time to help Sarah solve some shopping problems.



Measurement problems often involve using the operations that you have learned about. Watch for important words that tell you to add, subtract, multiply, or divide.

Remember to check the unit of measurement that is discussed in the problem. If the question asks about capacity or how much something will hold, you will use units like litres in your answer. If the question asks how long something will take, you will use minutes, hours, days, months, or years. If the problem is about mass, you will probably use grams or kilograms.

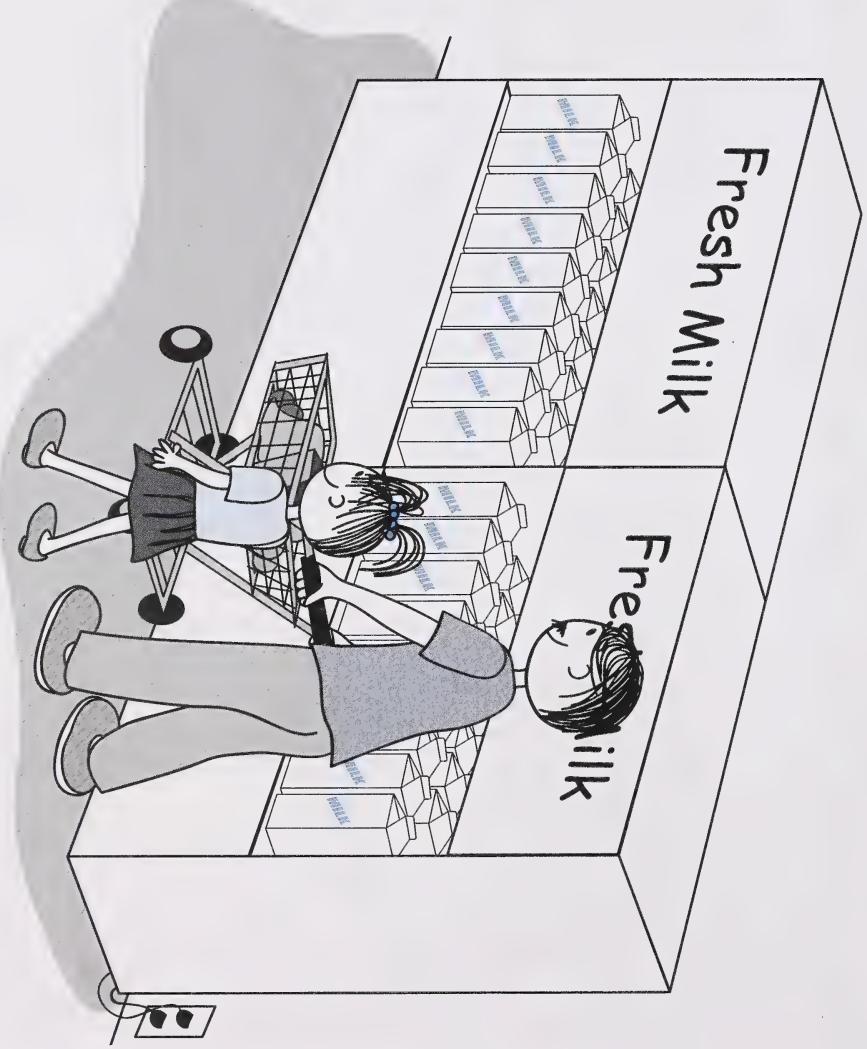


Before you add, subtract, multiply, or divide be sure that you are working with all the same kinds of units.



Use the problem-solving steps to solve each problem. Show your work. Write the answer in a sentence.

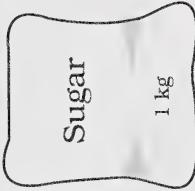
1. Sarah was helping her dad shop at the grocery store. Her dad said that they used 4 litres of milk each week. How much milk do they use in 3 weeks?



MORE PROBLEM SOLVING

2. Another item on their list was sugar. A large bag was 1 kilogram. The smaller bag was 550 grams. How much heavier was the large bag?

3. Sarah and her dad got to the store at 11:00. It was 12:15 when they finished shopping. How many minutes did it take them to shop?



MODULE 5

For more practice with time, try these websites:

- www.mathcentral.uregina.ca/

Type in “time” in the search window for a variety of activities having to do with time.

- www.kidsdomain.com/down/pc/discovertime.html

Download this game to practise telling time on a digital or analog clock.



I'm going to make a schedule
to help plan my time.

Go to Assignment Booklet 5B.



DAY 18: LOOKING BACK

Today, you will show your teacher what you have learned about measurement by completing some review questions in your Assignment Booklet. You may want to look back through your Student Module Booklet if you have difficulty with any of the questions.

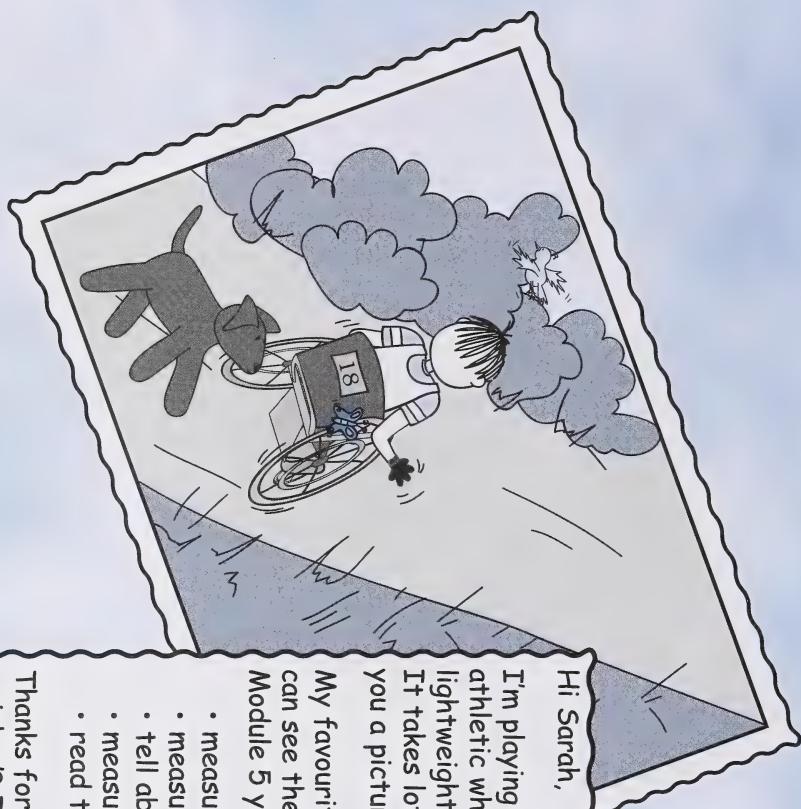
You will also do a Multiplication Number Facts exercise to send to your teacher.



Go to Assignment Booklet 5B. After completing the assignment for Day 18, read what Luke wrote to Sarah to recall all that you have learned about measurement. Then fill out the Student's Checklist and write you comments about the module.

SUMMARY

When Luke finished Module 5, he wrote back to Sarah.



Hi Sarah,

I'm playing basketball now and I'm so excited. I'm getting a new special athletic wheelchair. The wheels are tilted inward and it's really lightweight. Hey, that means it has less mass than my regular wheelchair. It takes lots of balance and practice, but it will go fast. I'll try to draw you a picture.

My favourite problem-solving strategy is to draw a picture. That way I can see the answer. I like to use arrays and grids too. Have you finished Module 5 yet? I've learned how to

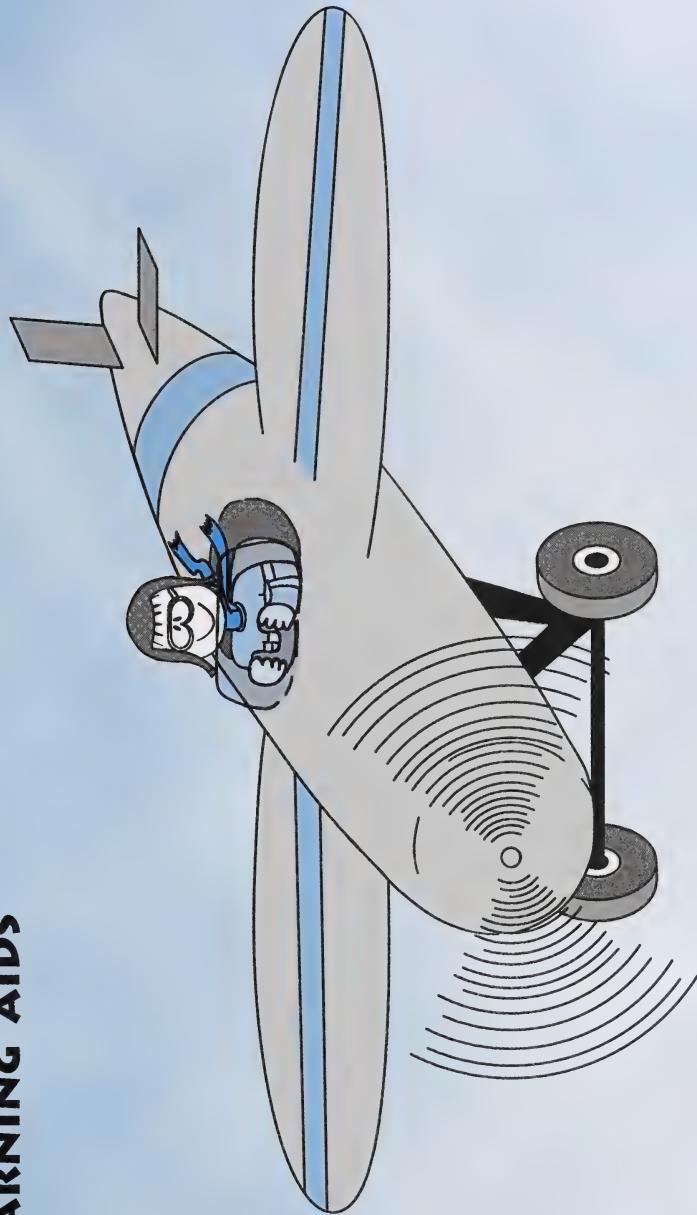
- measure length, width, and height
- measure area and perimeter
- tell about how much a container holds
- measure the mass of an object
- read time using digital clocks

Thanks for the picture of the deer. Do you know how much your new calf weighed? I'm looking forward to visiting you this summer.

Luke

APPENDIX

[GLOSSARY](#)
[IMAGE CREDITS](#)
[CUT-OUT LEARNING AIDS](#)



GLOSSARY

area: the space inside a flat shape or the amount of space covered by a shape

capacity: the amount a container holds

centimetre (cm): a unit used to measure length, distance, or height

$$1 \text{ cm} = 10 \text{ mm}$$

decimetre (dm): a unit that is used to measure length or distance

$$1 \text{ decimetre} = 10 \text{ centimetres}$$

gram (g): a unit used to measure mass

kilogram (kg) (kilo): a unit used to measure mass

$$1 \text{ kg} = 1000 \text{ g}$$

kilometre (km): a unit that is used to measure longer lengths or distances

$$1 \text{ kilometre} = 1000 \text{ metres}$$

leap year: a year with 366 days

An extra day is added to February.

litre (L): a unit of measure for measuring how much a container holds or its capacity. It is usually used to measure liquids.

mass: the amount of matter in an object

Matter is what all objects are made from. Mass is measured by weight.

millimetre (mm): a unit used to measure shorter lengths, distances, or heights

$$10 \text{ mm} = 1 \text{ cm}$$



metre (m): a unit that is used to measure length or distance

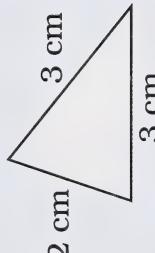
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1 metre = 100 centimetres

odometer: an instrument that measures the distance a vehicle travels by counting the number of times the wheels go round

perimeter: the distance around the outside of an object or figure



Example:

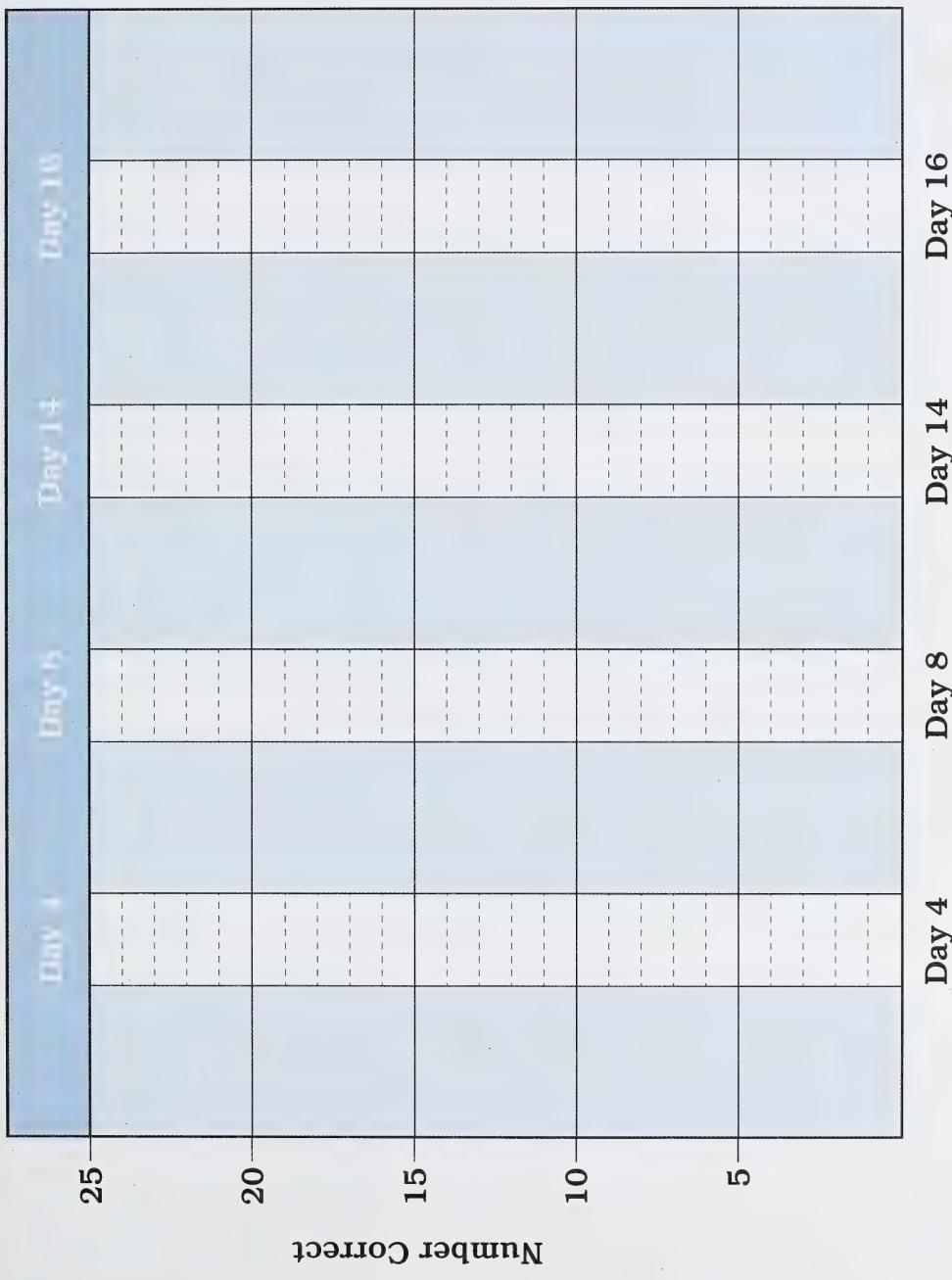
$$2 \text{ cm} + 3 \text{ cm} + 3 \text{ cm} = 8 \text{ cm}$$

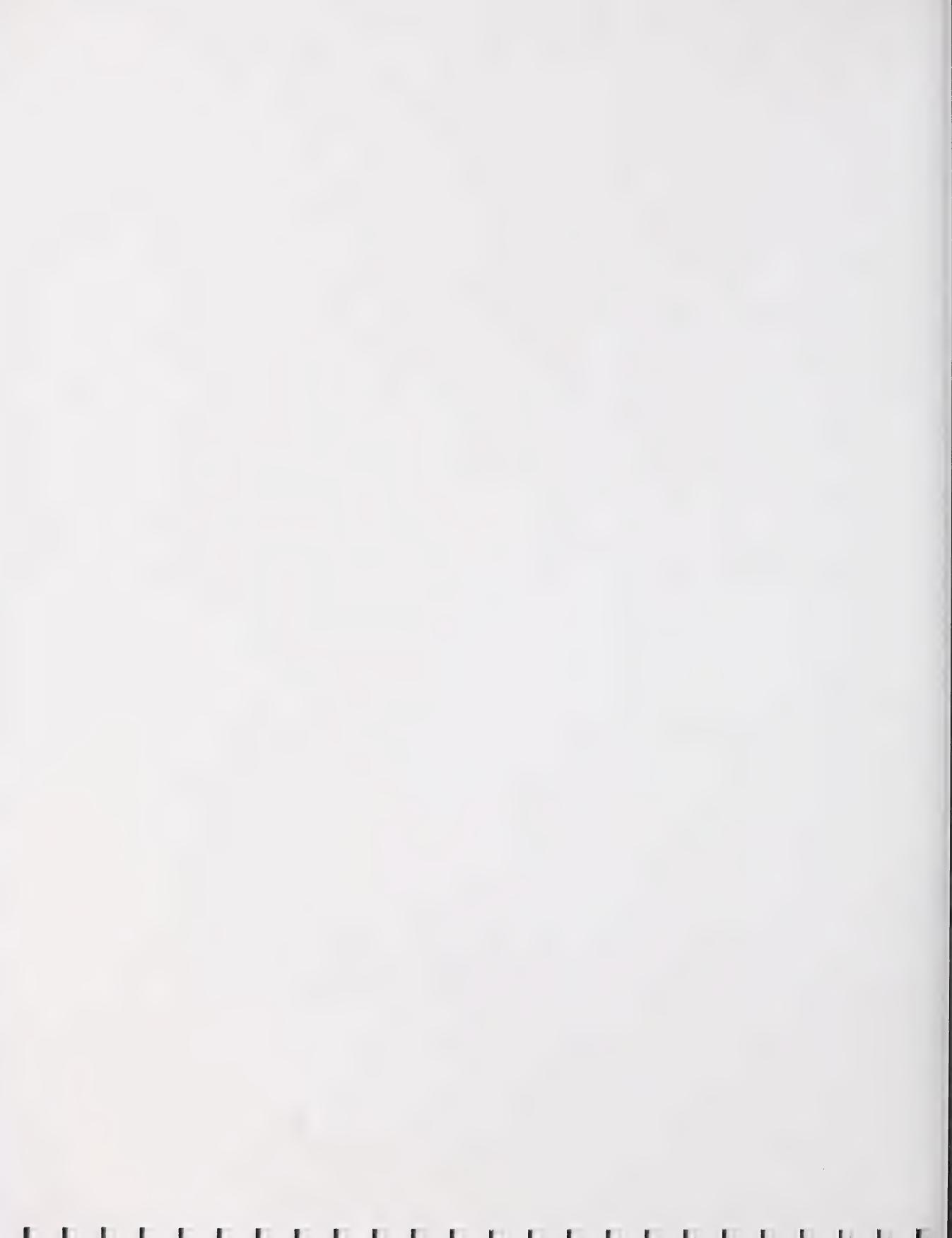
The perimeter of this figure is 8 centimetres.

standard unit: a unit such as a centimetre, litre, and kilogram that aids in measuring and is agreed upon by everyone



MATH FACTS GRAPH

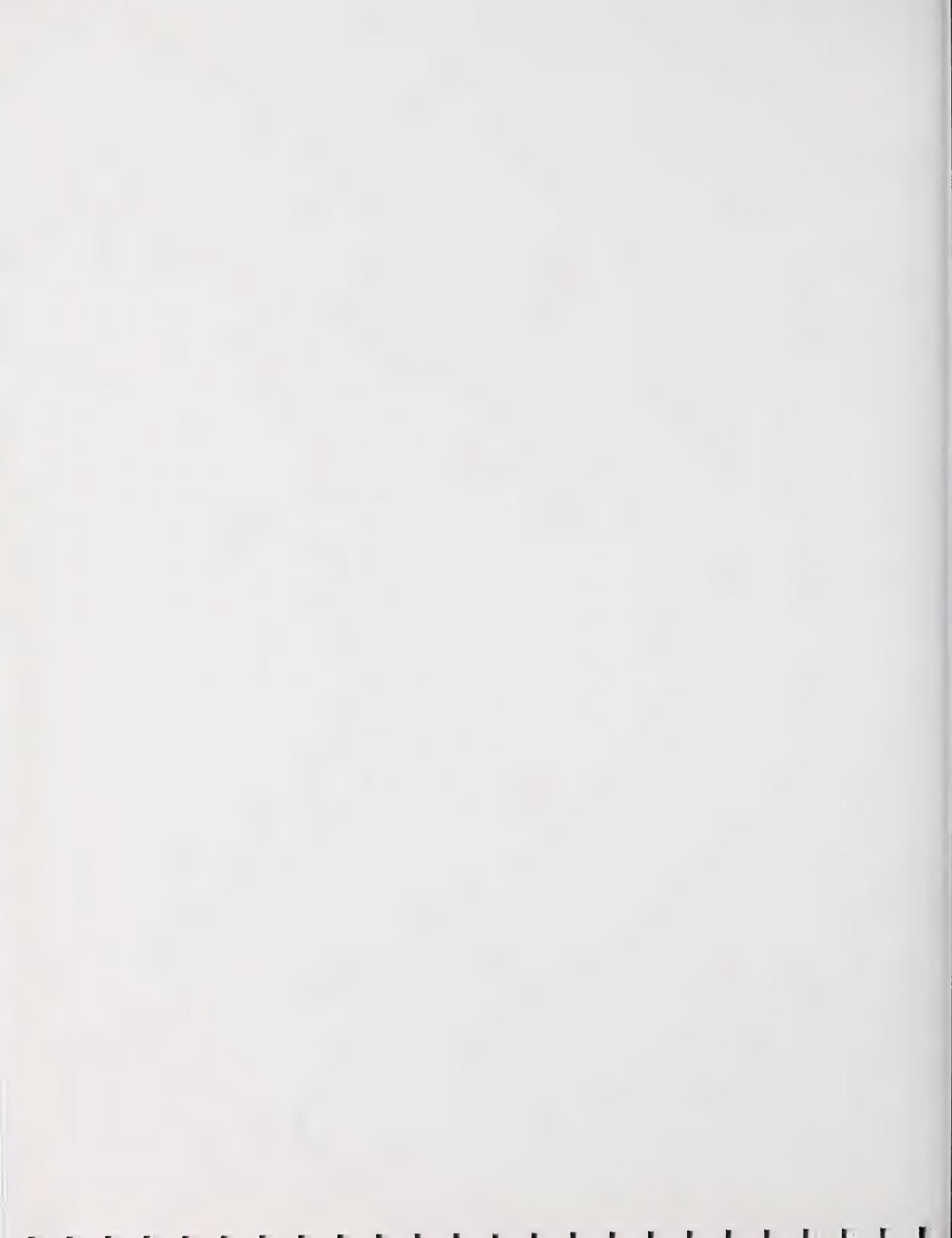




METRE-STICK

Cut out each section. Glue or tape the ends to make a paper strip 1 metre long. Ask your home instructor to help you cut a narrow piece of cardboard (or wood) 1 metre long and 2.5 centimetres wide. Glue the paper strip to the cardboard.





RULERS

Centimetre Ruler

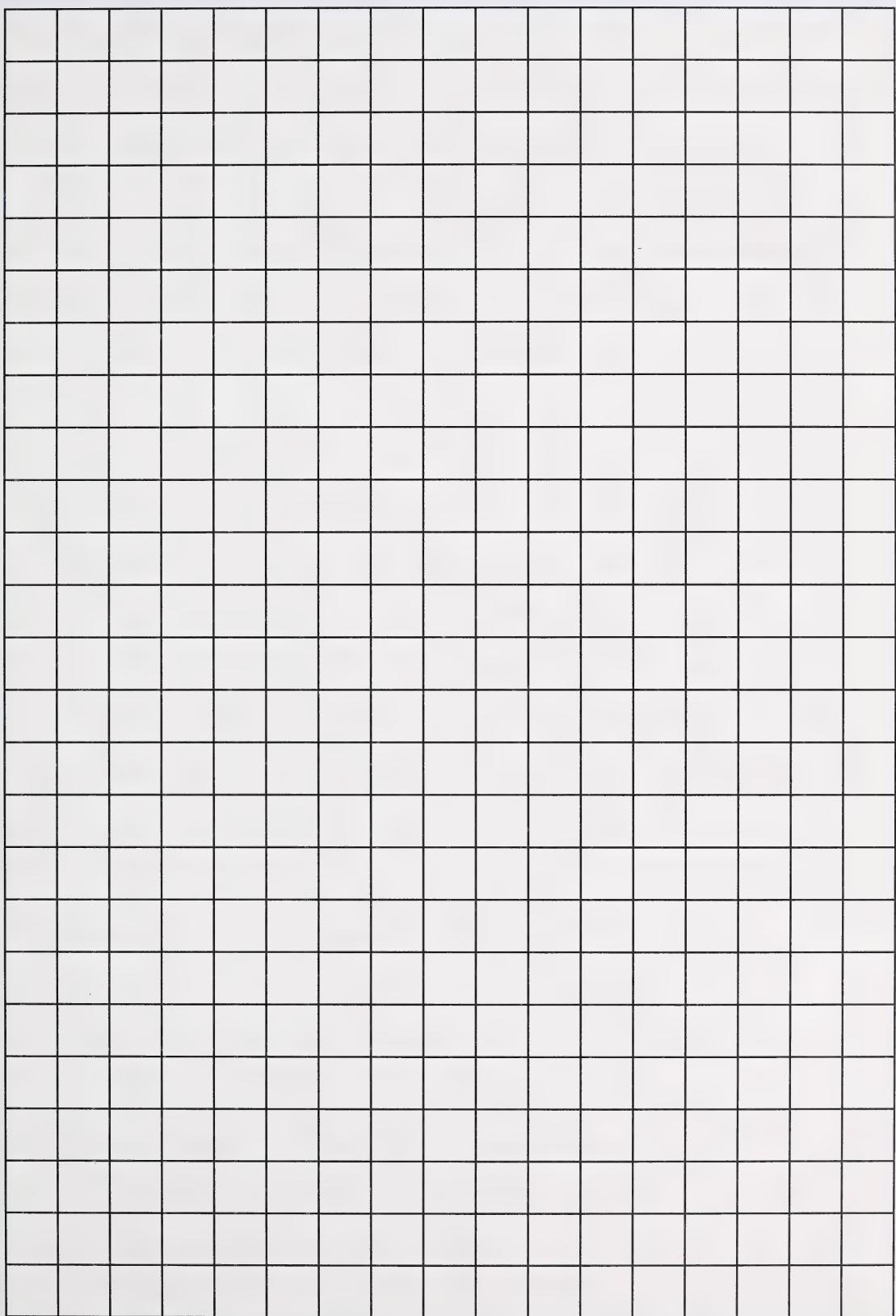


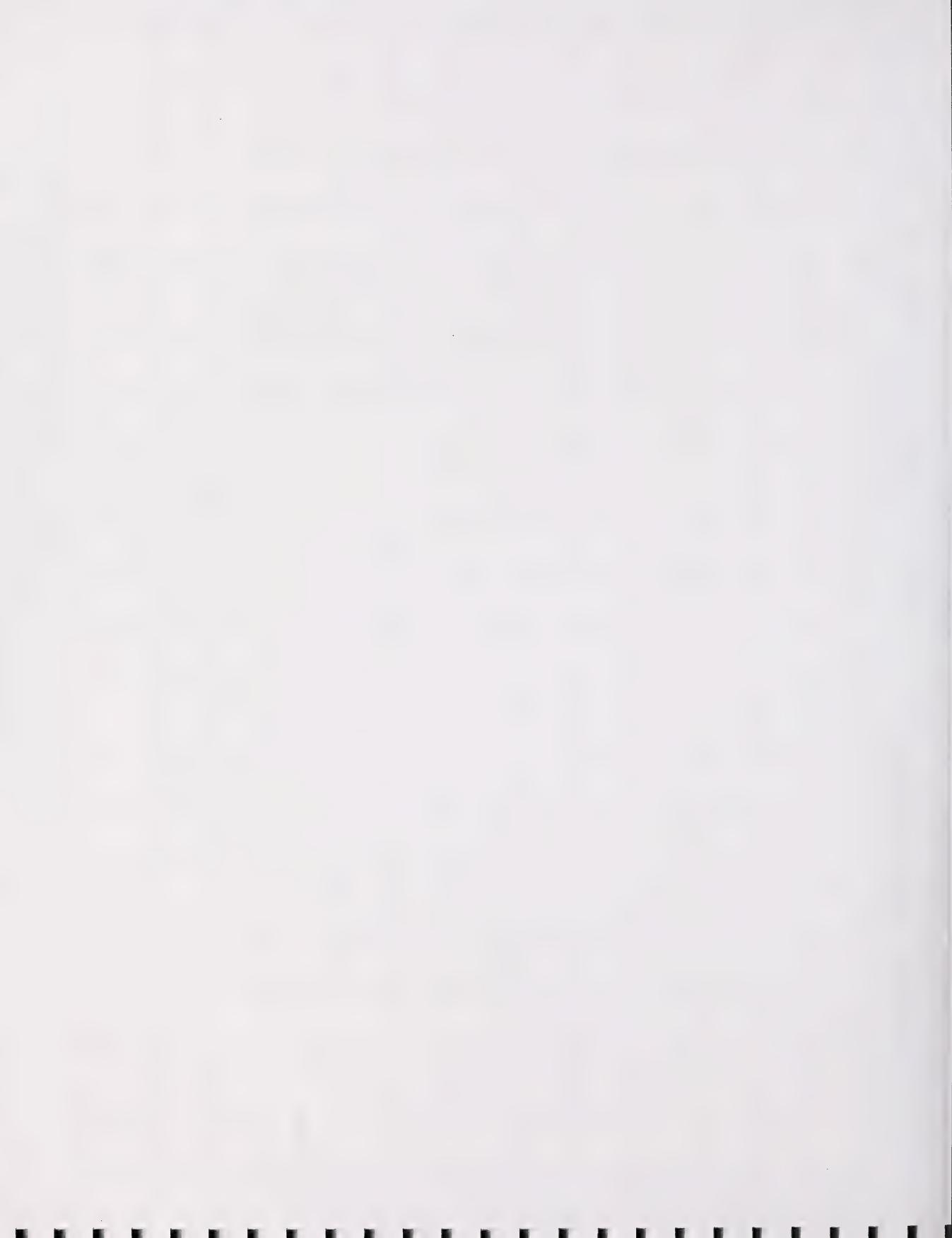
Decimetre Ruler



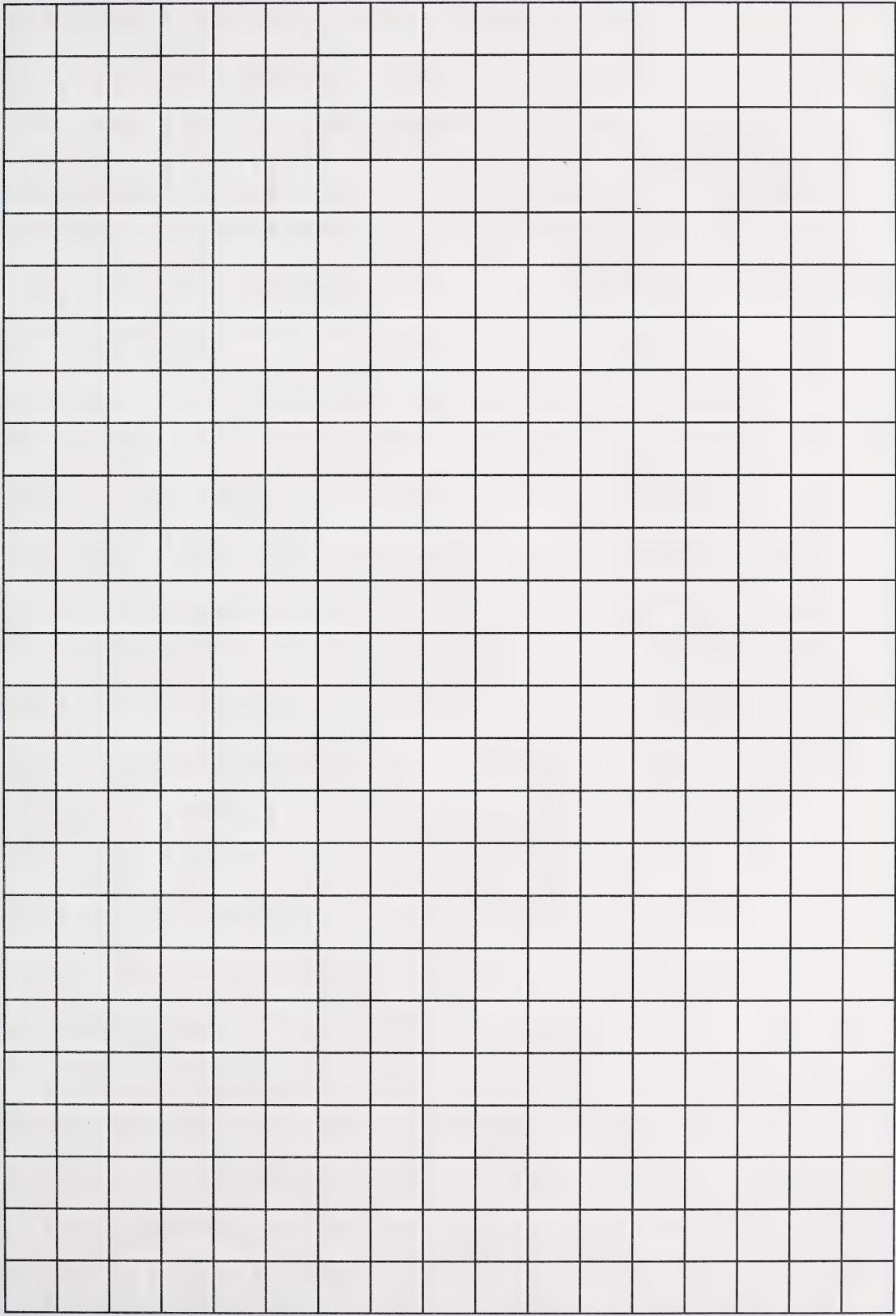


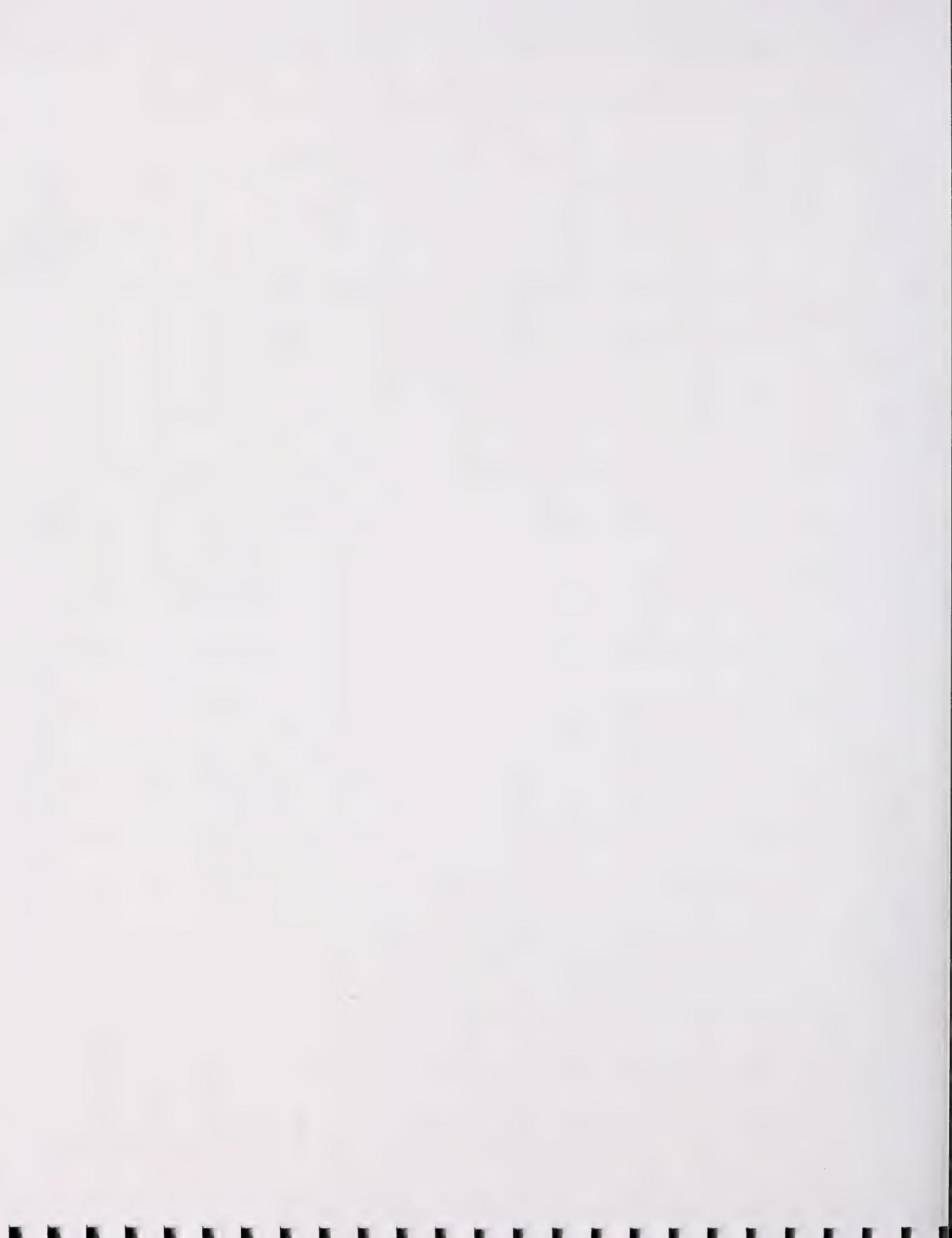
CENTIMETRE GRID PAPER



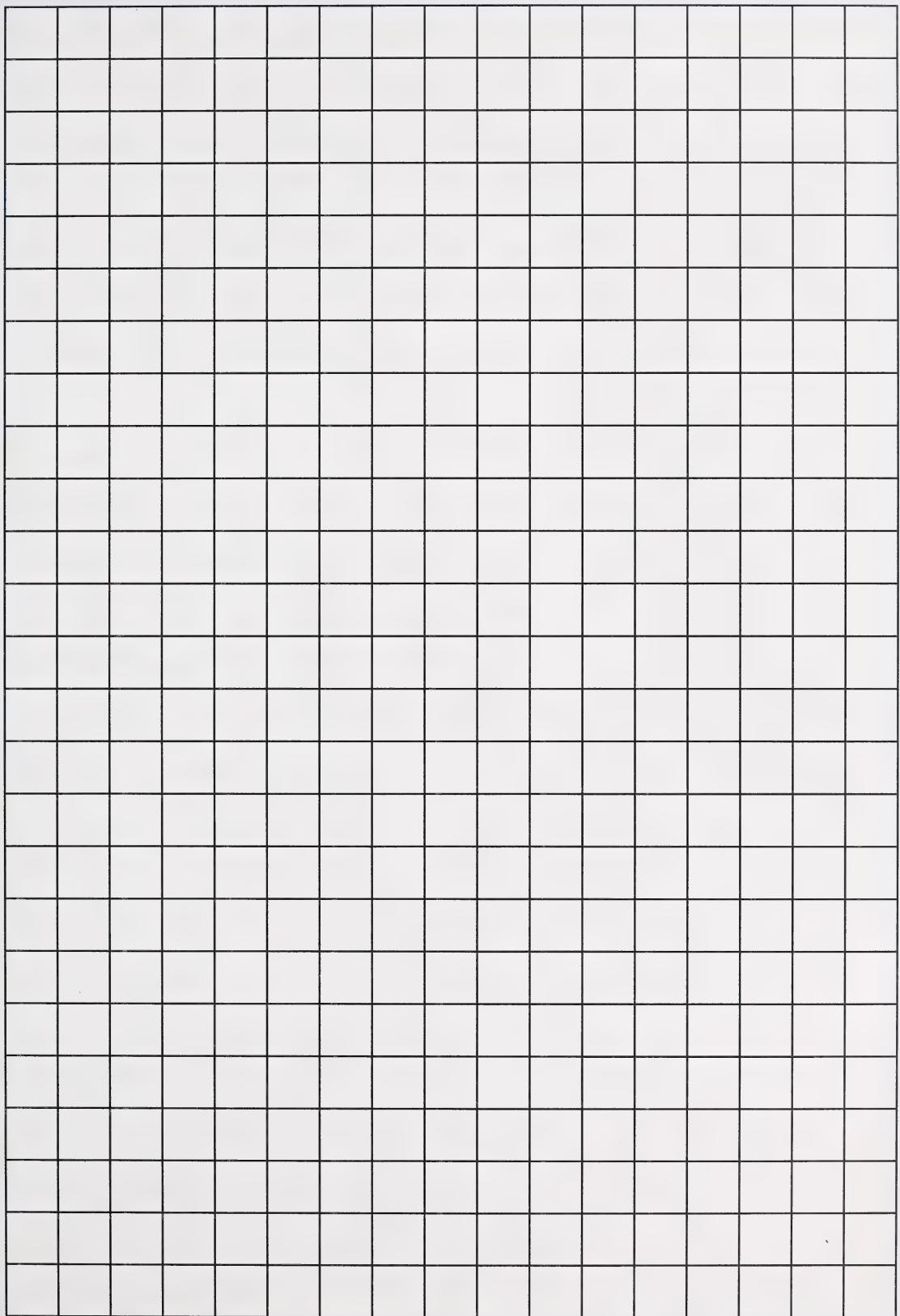


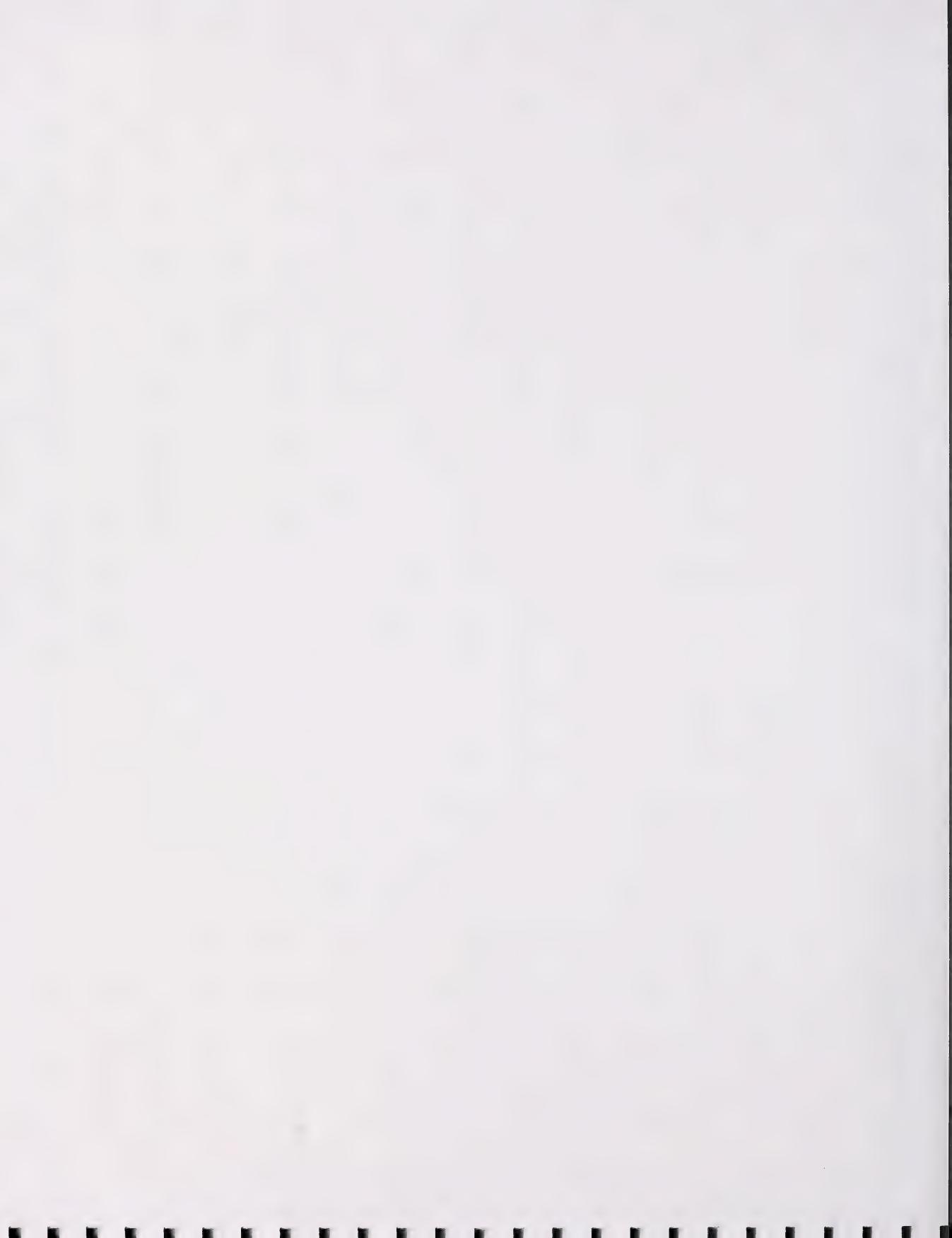
CENTIMETRE GRID PAPER



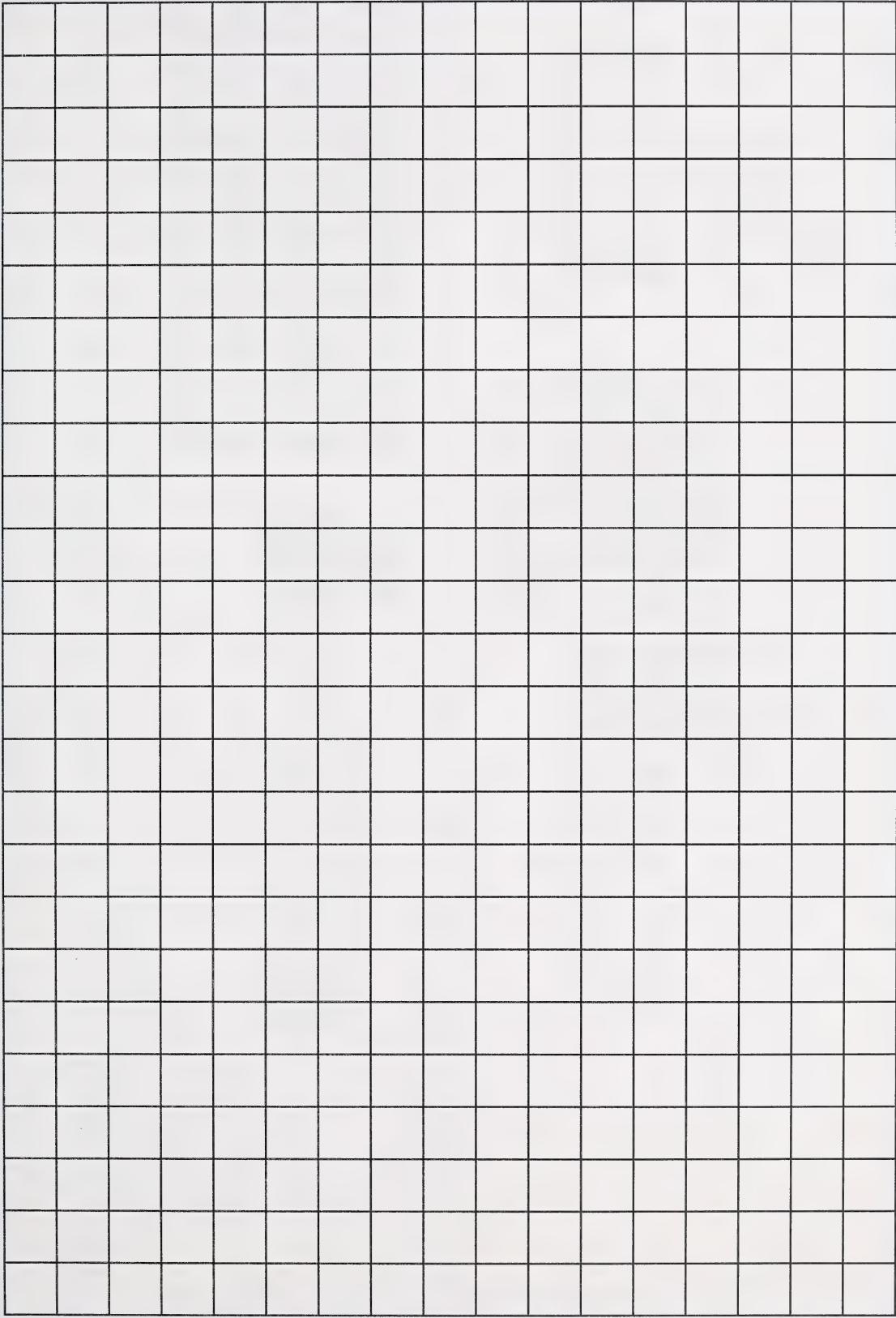


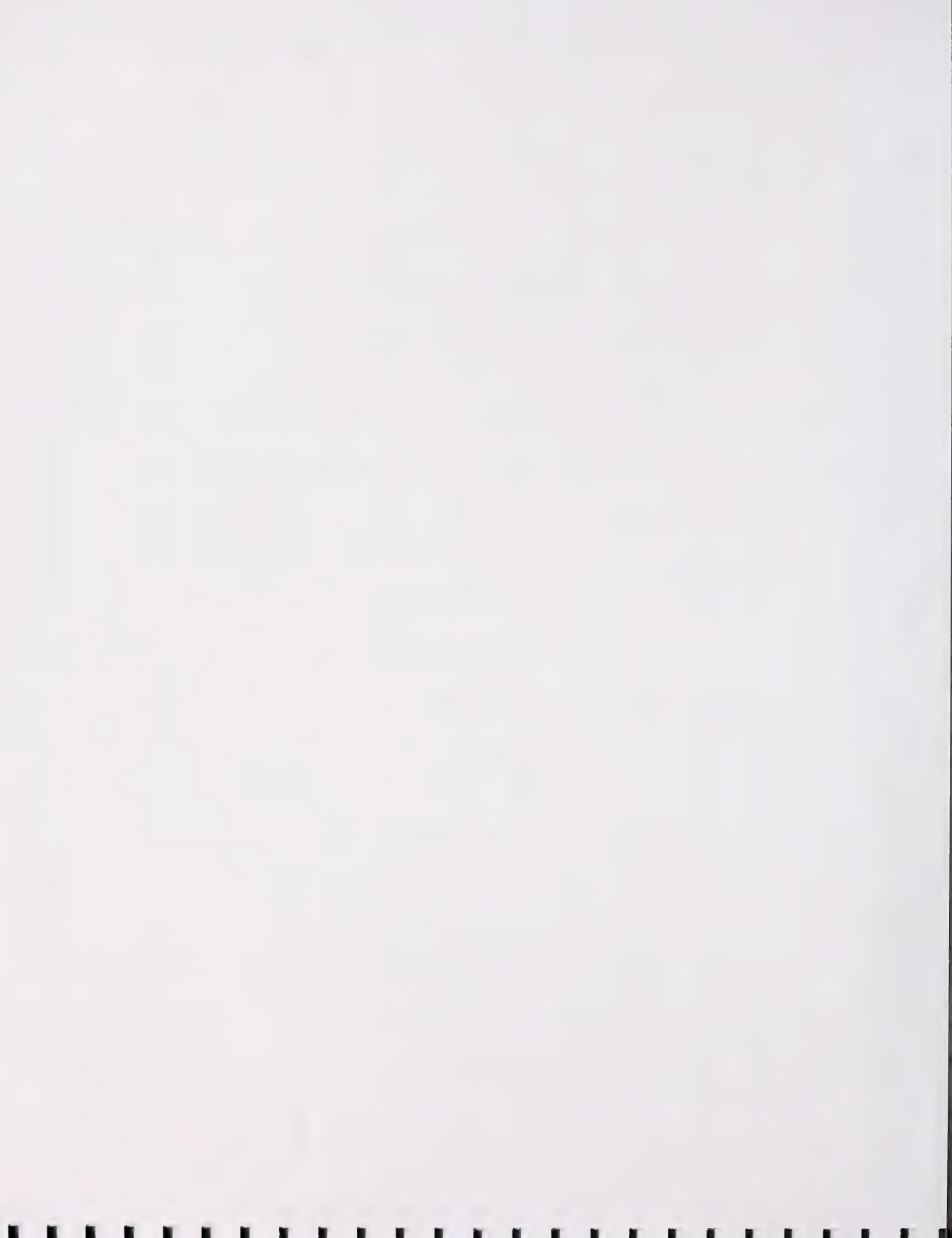
CENTIMETRE GRID PAPER





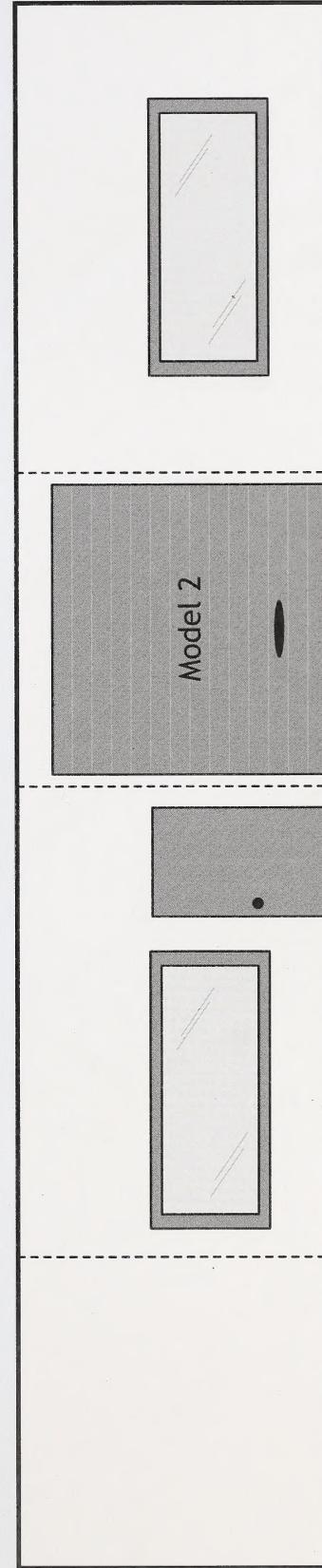
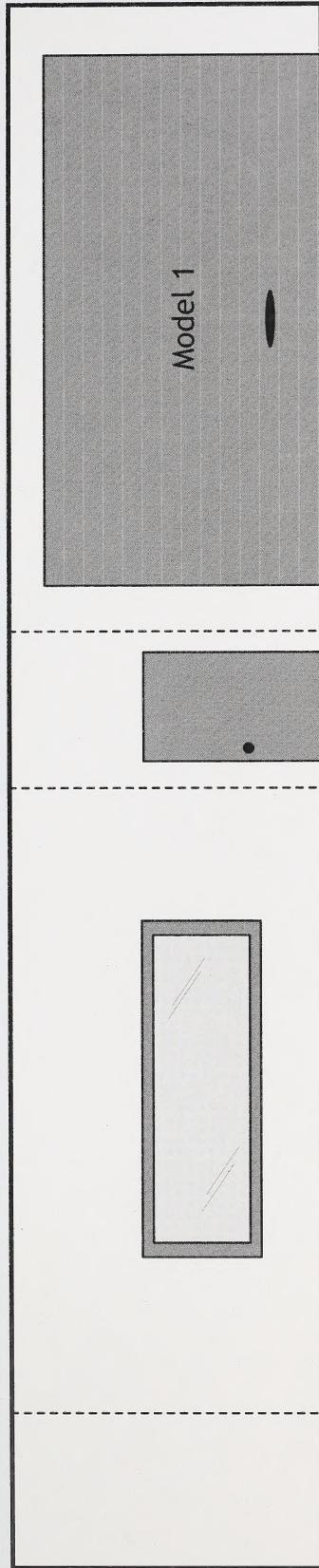
CENTIMETRE GRID PAPER



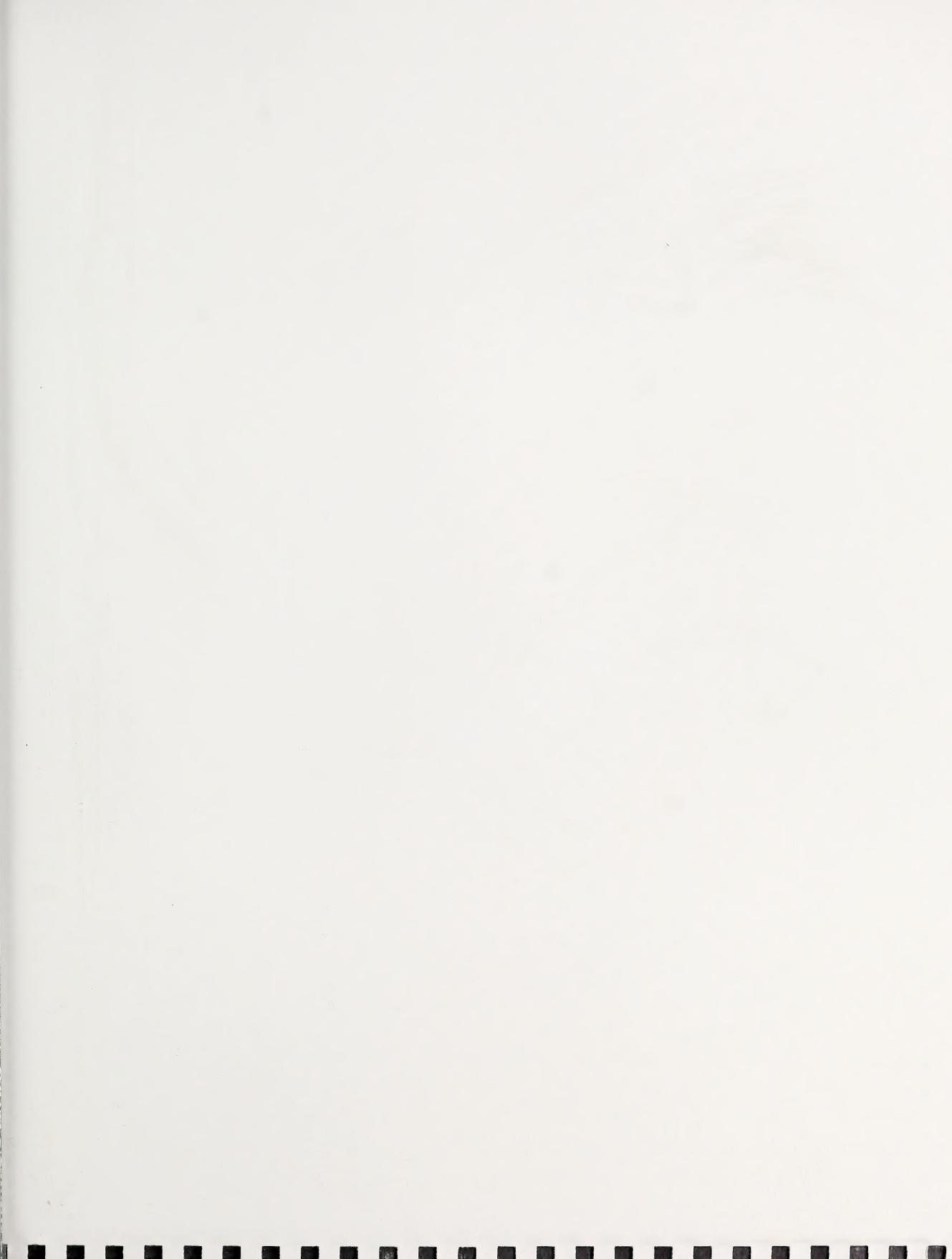


LUKE'S GARAGE MODELS

Cut out each strip. Fold on the dotted lines. Tape together the ends of each strip to make a rectangular garage model.







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